



# LEVEL 3

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### Revised Edition October 2009

This edition incorporates an addition of a sixth language category, Aboriginal Languages, to the Languages Other Than English domain.

Protocols and standards for the teaching of Aboriginal Languages appear in a separate booklet available for download from the VELS website (<http://vels.vcaa.vic.edu.au/aboriginal>)

This edition also contains revisions from January 2008 where the fifth language category, Classical languages, was added.

This edition incorporates minor amendments to the domain introductions and learning focus statements to indicate their relationship with the National Statements of Learning.

# Stages of Learning

While it is recognised that student learning is a continuum from Years Prep to 10, and different students develop at different rates, they broadly progress through three stages of learning from:

## **Years Prep to 4 – Laying the foundations**

In these years the curriculum focuses on developing the fundamental knowledge, skills and behaviours in literacy and numeracy and other areas including physical and social capacities which underpin all future learning.

## **Years 5 to 8 – Building breadth and depth**

In these years students progress beyond the foundations and their literacy and numeracy becomes more developed. An expanded curriculum program provides the basis for in depth learning within all domains in the three learning strands.

## **Years 9 to 10 – Developing pathways**

In these years students develop greater independence of mind and interests. They seek deeper connections between their learning and the world around them and explore how learning might be applied in that world. They need to experience learning in work and community settings as well as the classroom. They are beginning to develop preferred areas for their learning.

## **Levels**

Assessment against the different standards from Prep to Year 10 enables teachers, schools and parents to form a clear picture of student progress throughout the stages of learning from Years Prep to 10. The Standards include standards for student achievement at six levels over the 11 years of compulsory schooling. General expectations of when students will achieve the various standards are as follows:

<b>Standards</b>	<b>Stages of Learning</b>
Level 1 – End of Preparatory Year	Years Prep to 4 – Laying the Foundations
Level 2 – End of Year 2	
Level 3 – End of Year 4	
Level 4 – End of Year 6	Years 5 to 8 – Building breadth and depth
Level 5 – End of Year 8	
Level 6 – End of Year 10	Years 9 to 10 – Developing pathways

## Years Prep to 4

The *Victorian Essential Learning Standards* include standards at six levels. The levels broadly associated with schooling from Years Prep to 4 are as follows:

- Level 1 – Preparatory Year
- Level 2 – Years 1 and 2
- Level 3 – Years 3 and 4.

Beginning school is a major upheaval in children's lives, especially those who have spent the majority of their lives at home. The foundation knowledge, skills and behaviours that children must develop in Levels 1 and 2 to become successful learners at school are:

- English (*Reading, Writing, Speaking and listening*)
- Mathematics
- The Arts (*Creating and making*)
- Interpersonal Development (with an emphasis on socialisation)
- Health and Physical Education (*Movement and physical activity*).

Without the knowledge, behaviours and skills that are learned in these domains, children will be restricted in their capacity to succeed in the other domains as they progress through schooling. At Level 3 students begin to respond to information, ideas and beliefs from contexts beyond their immediate experience. Consistent with this development, additional standards across a range of domains in the three strands are introduced.

Domains without standards in Levels 1, 2 and 3 are nevertheless important areas of learning for children. Teachers are encouraged to provide experiences for children in each of these areas, either by teaching relevant subject matter independently or by integrating it with those domains that have measurement standards.

The first challenge at school is for children to socialise and to become engaged behaviourally, emotionally and cognitively. Engagement is a state that remains critical to success throughout schooling. Engagement moves from a minimal level of engagement where children conform, motivated by extrinsic demands, to a higher level of behavioural engagement where their motivation is more intrinsic. The latter includes resilient behaviour that is the capacity to overcome stress and adversity. Resilient children achieve more highly at school and better manage the ups and downs in life. Schools play a significant role in helping children to develop resilience.

Being socially engaged is also critical to the development of cognitive skills. Children build their ability to reason from a context or environment. The environment provides the practices, assumptions and values upon which reasoning is constructed. It follows that if children fail to socialise in a way where they understand the norms and values of a classroom, they will have difficulty understanding the reasoning that flows from those norms and values, and they will be subsequently hindered in their capacity to transfer that skill to more formal applications.

While behaviour is significantly determined by habits, it is also sometimes reactive, being influenced by emotional states and cognitive processes. Emotional engagement may be defined in terms of general wellbeing at school; for example, happiness, safety, calmness and empowerment, as opposed to sadness, worry, helplessness and stress. A key emotional skill that should be developed early and maintained throughout schooling is impulse control. Teachers can help children to develop impulse control by teaching them to recognise the feelings in themselves and others, by implementing behaviour management approaches that encourage children to regulate emotions, and by helping children to reflect on their behaviours.

Another key theme is that knowledge is constructed. We build our brains through experience, both real and perceived. Learning is cumulative, and consequently, the ability to transfer learning is a key skill. Children begin schooling with knowledge and skills. Much of this will be true and accurate, but some of it will not, even though it is believed to be true. One of the fundamental skills successful learners must develop is to reflect on learning, to link new knowledge to existing knowledge, to establish what is true and accurate, important and useful, and to challenge what is untrue and inaccurate. Giving children opportunities to be reflective improves the quality of learning, since learning with understanding is more likely to promote transfer than memory.

## Level 3 statement

In the Victorian Essential Learning Standards Level 3 is broadly associated with Years 3 and 4 of schooling.

Learners become more persistent and prolific in their learning and develop confidence through using specific skills, particularly literacy and numeracy. They are able to participate in discussion about ideas and beliefs and express informed opinions.

Key characteristics of students at this level include:

- broadening their knowledge and interest in a range of disciplinary domains
- developing an awareness of common values
- embodying resilient attitudes to learning and social behaviour
- transforming ideas into objects and systems
- applying independent thinking strategies
- discriminating between the quality of information when forming opinions.

Students have developed relationships with peers that provide opportunities for social growth, including 'giving appropriate feedback and acknowledging individual differences' (Interpersonal Development: *Building social relationships*). Through their relationships with family, friends and the local community students learn about the values and beliefs of others. They begin moving from a preoccupation with their own needs towards some level of recognition of the needs of others. Students become aware of values such as loyalty and trust, and experiment with negotiation, conflict management, group decision making, tolerance and social problem solving. They control their impulses and are aware of appropriate conduct in diverse contexts. They have the capacity to recognise feelings in themselves and others, they manage to regulate their emotions in routine situations, and they reflect on their behaviour, making adjustments when necessary. Values education and community involvement help to inform interpersonal development. They take increased responsibility for their own health and wellbeing, explaining 'basic concepts of identity and (using) simple strategies to maintain and support their self-worth' (Health and Physical Education: *Health knowledge and promotion*).

Students are aware of the development of specific knowledge and skills within a wider variety of learning domains, responding to information and ideas that go beyond their immediate experience. They 'read and respond to an increasing range of imaginative and informative texts with some unfamiliar ideas and information, vocabulary and textual features' (English: *Reading*) and 'express a point of view providing some information and supporting detail' (English: *Writing*). Their writing reflects a structure and uses a range of words and correct punctuation. In Science they develop a vocabulary to describe

their observations and investigations, and 'plan, design, conduct and report collaboratively on experiments related to their questions about living and non-living things, and events' (Science: *Science at work*). In Mathematics they collect and display data and 'apply number skills to everyday contexts such as shopping' (Mathematics: *Working mathematically*). Students learn about the importance of laws applying equally to everyone in a democracy and 'explain the difference between rules and laws' (Civics and Citizenship: *Civic knowledge and understanding*). They also describe some key events in Australian history 'including Anzac Day and key aspects of the histories of cultural groups that make up their class, community and nation' (The Humanities: *Humanities knowledge and understanding*). Students 'describe the human and physical characteristics of their local area and other parts of Victoria' (The Humanities: *Humanities knowledge and understanding*), and 'describe key features of arts works from their own and other cultures' (The Arts: *Exploring and responding*).

As students develop confidence in using specific skills, their effectiveness as learners increases rapidly. They are encouraged to set short-term goals and achieve these in cooperative and competitive situations. They interpret each other's work and participate in discussions to share and explore ideas and beliefs. They are encouraged to manage their level of effort, and to take steps to improve by implementing a range of strategies that may include rehearsing, organising, summarising, remembering and understanding. They 'identify their learning strengths and weaknesses and learning habits that improve learning outcomes.' (Personal Learning: *The individual learner*).

Students begin to discriminate between the quality of information when forming opinions, making sure that they 'collect information from a range of sources to answer their own and others' questions' (Thinking Processes: *Reasoning, processing and inquiry*). They apply thinking strategies to organise information and concepts in a variety of contexts, and transfer knowledge, skills and behaviours between contexts. Such strategies are supported by increased technical competence with computers, including the use of graphics and 'simple editing functions to manipulate the images for use in their products' (Information and Communications Technology: *ICT for creating*). Students also take a more active role in developing design briefs to meet a range of different needs and 'use their list of steps ... to choose appropriate tools, equipment and techniques' (Design, Creativity and Technology: *Producing*). They provide reasons for arguments, justify conclusions and participate in problem solving.

# Physical, Personal and Social Learning

A curriculum designed to equip students for the challenging world of the twenty-first century needs to ensure that students develop as people who take increasing responsibility for their own physical wellbeing, learning, relationships with others and their role in the local, national and global community.

Within the Physical, Personal and Social Learning strand the learning domains are:

## Health and Physical Education

A healthy, physically active lifestyle is conducive to more effective participation in all that society has to offer and greater levels of success within and beyond school. This requires students to develop the knowledge, skills and behaviours that enable them to:

- maintain good health and live a healthy lifestyle
- understand the role of physical activity in ensuring good health
- engage in physical activity.

## Interpersonal Development

In our highly interconnected and interdependent world, students must learn to work with others by:

- building positive social relationships
- working and learning in teams
- managing and resolving conflicts.

## Personal Learning

As students progress through school they need to be encouraged and supported to take greater responsibility for their own learning and participation at school. This involves developing as individual learners who:

- acquire self knowledge and dispositions which support learning
- can learn with peers, including by seeking and responding appropriately to feedback
- increasingly manage their own learning and growth including by setting goals and managing resources to achieve these
- recognise and enact appropriate values within and beyond the school context.



## Civics and Citizenship

Students need to develop the knowledge, skills and behaviours that enable them to take action as informed, confident members of a diverse and inclusive Australian society. They need to understand the political and legal systems and processes and the history that underpins them. This involves a focus on students:

- understanding their identity and roles in their community
- knowing their rights and responsibilities as citizens
- appreciating Australia's role in the global community
- having the knowledge, skills and behaviours to participate in society and take responsible action in relation to other citizens and the environment at a local and broader level.

# Health and Physical Education

## Introduction

The domain of Health and Physical Education provides students with knowledge, skills and behaviours to enable them to achieve a degree of autonomy in developing and maintaining their physical, mental, social and emotional health. This domain focuses on the importance of a healthy lifestyle and physical activity in the lives of individuals and groups in our society.

This domain is unique in having the potential to impact on the physical, social, emotional and mental health of students. It promotes the potential for lifelong participation in physical activity through the development of motor skills and movement competence, health-related physical fitness and sport education.

Engaging in physical activity, games, sport and outdoor recreation contributes to a sense of community and social connectedness. These are vital components of improved wellbeing.

Students' involvement in physical activity can take many forms, ranging from individual, non-competitive activity through to competitive team games. Emphasis is placed on combining motor skills and tactical knowledge to improve individual and team performance. Students progress from the development of basic motor skills to the performance of complex movement patterns that form part of team games. They learn how developing physical capacity in areas such as strength, flexibility and endurance is related to both fitness and physical performance.

Students progress from learning simple rules and procedures to enable them to participate in movement and physical activity safely, to using equipment safely and confidently. Students undertake a variety of roles when participating in sports such as umpire, coach, player and administrator and assume responsibility for the organisation of aspects of a sporting competition.

This domain explores the developmental changes that occur throughout the human lifespan. It begins by identifying the health needs necessary to promote and maintain growth and development, followed by discussion of significant transitions across the lifespan including puberty, to gaining an understanding of human sexuality and factors that influence its expression. The exploration of human development also includes a focus on the establishment of personal identity, factors that shape identity and the validity of stereotypes.

Students develop an understanding of the right to be safe and explore the concepts of challenge, risk and safety. They identify the harms associated with particular situations and behaviours and how to take action to minimise these harms.

Through the provision of health knowledge, this domain develops an understanding of the importance of personal and community actions in promoting health and knowledge about the factors that promote and protect the physical, social, mental and emotional health of individuals, families and communities. Students investigate issues ranging from individual lifestyle choices to provision of health services by both government and non-government bodies. In investigating these issues, they explore differing perspectives and develop informed positions.

This domain examines the role of food in meeting dietary needs and the factors that influence food choice. Students progress from learning about the importance of eating a variety of foods to understanding the role of a healthy diet in the prevention of disease.

The Health and Physical Education domain provides students with the knowledge, skills and behaviours necessary for the pursuit of lifelong involvement in physical activity, health and wellbeing.

## Structure of the domain

The Health and Physical Education domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Health and Physical Education, standards for assessing and reporting on student achievement apply from Level 1.

## Dimensions

Standards in the Health and Physical Education domain are organised in two dimensions.

- Movement and physical activity – from Level 1
- Health knowledge and promotion – from Level 3.

### Movement and physical activity

The *Movement and physical activity* dimension focuses on the important role that physical activity, sport and recreation need to play in the lives of all Australians by providing opportunities for challenge, personal growth, enjoyment and fitness. It promotes involvement in a manner that reflects awareness that everyone has the right to participate in a healthy and active lifestyle. It develops students' confidence in using movement skills and strategies to increase their motivation to become active as well as improve their performance and maintain a level of fitness that allows them to participate in physical activity without undue fatigue. It builds understanding of how training and exercise in areas such as strength, flexibility and endurance relate to physical performance.

### Health knowledge and promotion

The *Health knowledge and promotion* dimension examines physical, social, emotional and mental health and personal development across various stages of the lifespan. It focuses on safety and the identification of strategies to minimise harms associated with particular situations or behaviours. Students examine the promotion of health of individuals and the community through the use of specific strategies and the provision of health resources, services and products. They examine the factors that influence food selection and the role of nutrition on health growth and development.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

The Statements of Learning were developed as a means of achieving greater national consistency in curriculum outcomes across the eight Australian states and territories. It was proposed that they be used by state and territory departments or curriculum authorities (their primary audience) to guide the future development of relevant curriculum documents. They were agreed to by all states and territories in August 2006.

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELs. In the majority of cases, the VELs learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELs learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Health and Physical Education, they practise and use complex manipulative and locomotor skills in a range of movement environments (indoor, outdoor and aquatic). They practise and develop competency in a range of complex motor skills such as leaping, dodging, the over-arm throw, dribbling and striking balls, cart wheeling and handstanding. In aquatic environments they practise a range of movements such as: propelling the body on the front and back using freestyle, backstroke, breaststroke and survival backstroke for 10 to 20 metres; and a land-based rescue. They discuss the performance criteria of motor skills and practise observing a partner's performance. Through modified major games (for example, games with modified rules, equipment, playing field, length of game or numbers on a team such as modified netball), and athletics activities (for example, discus, shot put and modified versions of jumps), students begin to apply their skills in sport-specific settings. During gymnastics or dance sessions students learn, reproduce and choreograph more complex movement sequences. Students participate in a range of activities that promote health-related fitness components of cardio-respiratory fitness, flexibility and strength and explore the link between health-related fitness and lifestyle activities.

They explore basic games' tactics such as: introducing the concepts of attack and defence; following the rules of the game; and describing the roles of various positions. They begin to work with others to set and achieve goals in both cooperative and competitive games' settings. They invent games for themselves and others to play, and discuss and practise appropriate safety considerations for these games. Students consider the different tasks undertaken by officials to ensure a game or activity can proceed smoothly. They discuss how all students can have equal opportunity to participate, irrespective of skill level. Where appropriate, they participate in competitive activities through intra-school sport.

Students learn about outdoor adventure activities to enable them to better understand the nature of outdoor environments and how they can prepare themselves for safe involvement in such activities.

Students examine their physical development in detail; for example, changes in their height. They develop an understanding of human development across the lifespan as a continuous process involving changes and predictable stages such as conception, prenatal, infancy, childhood, adolescence, adulthood and aging. Students learn that while the nature of changes associated with these stages is predictable, the timing will vary for individuals. Students begin to explore how their emotions are affected by the way they view themselves, identifying factors (including the influence of peers and family) that affect, positively or negatively, their sense of identity and self-worth. They learn skills for maintaining and supporting their self-worth. They examine roles and expectations of people which arise from gender, culture and age.

They investigate a variety of scenarios identifying potential hazards and harms at home, at school and in the community, using given criteria such as a home safety checklist. They begin to explore the relationship between safety, risk and challenge, with an emphasis on developing their knowledge and understanding of strategies and skills to reduce harms, prevent accidents and create safe and supportive environments.

Students explore how the school and community contribute to the health of its members, both through the impact of its physical and social environments and through the services and facilities it provides. Examples of facilities and services that contribute to health could include school crossings, safety signs, playgrounds, parks, clubs and a school environment free of bullying.

Students develop their understanding of the need for variety and frequency of food intake in active and healthy lives, and begin to relate the foods they eat with the energy they need for everyday and physical activities. They consider the physiological, social, cultural and economic factors that influence food choice, and the impact of these factors on healthy eating. Examples could include: how taste or mood affects food choice; the impact of meeting nutritional requirements for growth and energy; the influence of peers and family on food choice; popular foods in other countries; and the availability of low cost healthy snacks or lunches. Students reflect on the importance of healthy eating and participation in physical activity for their physical, social and emotional health.

## Standards

### Movement and physical activity

At Level 3, students perform a broad range of complex motor skills. They demonstrate a wide variety of motor skills and apply them to basic, sport-specific situations. They create and perform coordinated movement sequences that contain a variety of motor skills and movement patterns. They participate regularly in physical activities for the purpose of improving skill and health, and identify and describe the components of health-related fitness. They begin to use basic games' tactics. They work with others to achieve goals in

both cooperative and competitive sporting and games' situations, explain the concept of fair play, and respect the roles of officials. Students follow safety principles in games and activities.

**Health knowledge and promotion**

At Level 3, students describe the stages of human development across the human lifespan. Students explain basic concepts of identity and use simple strategies to maintain and support their self-worth. They identify basic safety skills and strategies at home, school and in the community, and describe methods for recognising and avoiding harmful situations. They describe how physical and social components in the local environment contribute to wellbeing and identify how health services and products address the health needs and concerns of the local community. They identify healthy eating practices and explain some physiological, social, cultural and economic reasons for people's food choices.

# Interpersonal Development

## Introduction

Learning in the Interpersonal Development domain supports students to initiate, maintain and manage positive social relationships with a range of people in a range of contexts. It is through the development of positive social relationships that individuals become linked to society, develop a sense of belonging and learn to live and work with others. In a pluralistic, multicultural society such as Australia, with varying interests, values and beliefs, it is essential that individuals learn to participate in groups whose members are from diverse backgrounds. In this domain there is a particular focus on developing students' capacity to work cooperatively as part of a team as this is widely acknowledged as being a core requirement for success in the workplace and in the community.

Building effective social relationships and relating well to others requires individuals to be empathetic, and to be able to deal effectively with their own emotions and inner moods. It also requires them to be aware of the social conventions and responsibilities that underpin the formation of effective relationships. All social relationships have the potential to create conflict. Students need to develop the skills and strategies to manage and resolve conflict in a sensible, fair and effective manner and not see it as something to avoid or eliminate.

Working cooperatively as part of a team requires the skills outlined above. In addition, it requires individuals to be able to balance commitment to the group and its norms with their own needs. This requires competence in presenting their own ideas and listening to those of others, approaching topics from different viewpoints, and understanding their specific role and responsibilities in relation to those of others and the overall team goal.

Relationships with peers and adults at the school provide students with opportunities for reflection and growth. Adults at the school can reinforce this learning by providing positive role models. Interactions should be positive, fair, respectful and friendly and be supported by a classroom culture which is open, honest and accepting.

The Interpersonal Development domain provides students with learning opportunities and experiences that will support their learning across the curriculum, particularly in relation to working in teams where collaboration and cooperation, sharing resources and completing agreed tasks on time are highlighted. Learning related to building social relationships encourages students to maintain positive learning environments across their learning programs.



## Structure of the domain

The Interpersonal Development domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, where applicable, a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Interpersonal Development, standards for assessing and reporting on student achievement apply from Level 1, although at this level they are not organised by dimension.

### Dimensions

Standards in the Interpersonal Development domain are organised in two dimensions:

- Building social relationships
- Working in teams.

#### Building social relationships

Learning in the *Building social relationships* dimension supports students to initiate, maintain and manage positive social relationships with a diverse range of people in a range of contexts. Students learn about and practise the social conventions which underpin relationships and learn how to act in socially responsible ways. Strategies for understanding, managing and resolving conflict are also an important focus.

#### Working in teams

In the *Working in teams* dimension students develop the knowledge, skills and behaviours to cooperate with others to contribute to the achievement of group goals. The focus is not only task achievement, but also on contributing to, and reflecting on, the learning which occurs through being part of a team.

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During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Interpersonal Development, they interact with their peers, older and younger students, and adults in both informal and formal contexts. They develop their skills and strategies for getting to know and understand others within increasingly complex situations. With teacher support, they identify different types of friendships and relationships. They discuss the expectations they have of friendship and relationship groups and acknowledge the expectations that others have of them. They recognise that relationships change and that positive relationships do not depend on always agreeing with one another.

Students are encouraged to think about their values and how these affect their feelings and behaviour. They are supported to develop relationships based on respect and the valuing of individual differences; for example, speaking respectfully about others, listening and responding appropriately and encouraging others' contributions. They learn to respect other students' belongings and, when appropriate, to share their own.

Students begin to explore the link between their feelings and their behaviour. They learn about empathy and use this to begin to respond to the needs of others. Using prompts and questions, they develop skills in giving and accepting constructive feedback; for example, praising or making suggestions for improvement.

Students are introduced to a variety of strategies for dealing with conflict and bullying. By articulating the conflict to be resolved, they discuss options and outcomes and work with others to develop plans and procedures to reduce the possibility of conflict, avoid or resolve conflict.

In teams, students work towards the achievement of agreed goals within a set timeframe. With teacher assistance, they develop awareness of their role in the team and responsibilities in various situations, and interact with others accordingly. Students begin to be aware that different points of view may be valid. Using provided criteria, they reflect on the effectiveness of the teams in which they participate.

### **National Statements of Learning**

This Learning focus statement incorporates aspects of the National Statements of Learning for Civics and Citizenship, Year 3

## **Standards**

### **Building social relationships**

At Level 3, students demonstrate respect for others and exhibit appropriate behaviour for maintaining friendships with other people. They support each other by sharing ideas and materials, offering assistance, giving appropriate feedback and acknowledging individual differences. They work with others to reduce, avoid and resolve conflict.

### **Working in teams**

At Level 3, students cooperate with others in teams for agreed purposes, taking roles and following guidelines established within the task. They describe and evaluate their own contribution and the team's progress towards the achievement of agreed goals.

# Personal Learning

## Introduction

Learners are most successful when they are mindful of themselves as learners and thinkers within a learning community. The Personal Learning domain focuses on providing students with the knowledge, skills and behaviours to be successful, positive learners both at school and throughout their lives. They are supported to develop the confidence and ability to be adaptive and take an active role in shaping their own futures in a world of constant change.

Students can learn many things by will and effort, particularly if they see that the learning is relevant; however, the learning of students is enhanced when they are supported to develop intentional strategies that promote learning. They need to understand what it means to learn, who they are as learners and how emotions affect learning. They also need to develop skills in planning, monitoring and revising their work, and reflecting on and modifying their learning practices.

Consequently, as students progress through school they need to be encouraged and supported to take greater responsibility for their own learning, their participation in learning activities and the quality of their learning outcomes. They need to develop a sense of themselves as learners and develop the knowledge and skills to manage their own learning and emotions. As they do this, they move from being supported learners to autonomous learners.

Students learn to seek and use feedback from their teachers to develop their content knowledge and understanding. They also learn to seek and use feedback from their peers and draw on other members of the community who may provide feedback, knowledge and advice about skills that support their learning. They need to develop the capacity to reflect on their learning in systematic ways.

This domain supports the development of autonomous learners, with a positive sense of themselves as learners, by providing all learners with the knowledge, skills and behaviours to:

- develop an understanding of their strengths and potential
- seek and respond appropriately to feedback from their teachers, peers and other members of the community
- develop skills of goal setting and time and resource management
- increasingly manage their own learning and growth by monitoring their learning, and setting and reflecting on their learning goals
- learn to understand and to manage their own emotions
- develop resilience and dispositions which support learning

- recognise and enact learning principles within and beyond the school
- prepare for lifelong learning.

The achievement of these outcomes requires the creation of a school and classroom culture where all students are respected and valued as individuals with the capacity to learn and think, and where self-regulated effort in learning is promoted.

## Structure of the domain

The Personal Learning domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 3, a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Personal Learning, standards for assessing and reporting on student achievement apply from Level 3.

### Dimensions

Standards in the Personal Learning domain are organised in two dimensions:

- The individual learner
- Managing personal learning.

#### The individual learner

*The individual learner* dimension focuses on students developing knowledge about their personal characteristics and capabilities, and those they need to develop to support their approaches to and reflections about learning. Students explore and practise skills and behaviours which support learning. They develop the capacity to monitor their own learning, identifying learning strengths and areas requiring improvement. They seek and use teacher feedback to develop their content knowledge and understanding. They explore the ways in which personal values affect learning and recognise the need to develop ethical frameworks for operating fairly within the classroom and recognising and respecting individual differences of class members. Students recognise their learning preferences and needs and respect that these may

differ from those of others. They develop confidence in making informed decisions about their learning.

### Managing personal learning

The *Managing personal learning* dimension focuses on the knowledge, skills and behaviours required to enable successful management of personal learning. Students develop skills in goal setting and time and resource management and focus on task achievement. They increasingly develop the skills to work independently, becoming autonomous learners. Students develop strategies to manage their emotions and develop positive attitudes towards learning.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

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During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Personal Learning, they begin to build on personal strengths by recognising strategies for learning which help them learn most effectively. With support, they use their past learning to inform their future learning, and begin to set learning improvement goals.

Students participate in a diverse range of learning activities that allow them to acknowledge their development as learners. They monitor their learning through strategies such as share time and seeking feedback from the teacher and, where appropriate, their peers.

Students learn to recognise the various positive and negative emotions that may be associated with their learning, and that feelings of uncertainty do not equate with an inability to complete a task. They explore the implications of impulsive behaviour and identify strategies they can use to manage impulsiveness, such as taking time to think about their opinions before giving them and considering alternative viewpoints before making a value judgment about an idea. They develop an awareness of their emotions and the capacity to use positive self-talk; for example, by compiling a list of strategies they can implement when they are feeling uncertain. Through reflection on their achievements across a range of tasks, they begin to understand the roles of persistence and effort in completing tasks.

Students reflect on their own behaviour in the classroom and the personal values that inform those behaviours. They develop and respect protocols, such as codes of cooperation, that promote learning with peers. They begin to compare their own values with those agreed to by the class. Students reflect on their contribution to the creation of a positive learning culture in the classroom and recognise that they may learn with and from peers.

With support, students develop strategies for managing their own learning, and identify the need for resource and time management in completing short tasks. They begin to use various tools, such as personal diaries and portfolios, to help them reflect on the effectiveness of the strategies they use in learning and in recording and commenting on task outcomes. They learn to set simple goals for future learning such as 'to practise a specific skill'. They begin to review their work to check for accuracy.

## Standards

### The individual learner

At Level 3, students describe the factors that affect learning and identify strategies that will enhance their own learning. With support, they identify their learning strengths and weaknesses and learning habits that improve learning outcomes. They seek teacher feedback to develop their content knowledge and understanding. They make and justify some decisions about their learning and, with support, set learning improvement goals. They contribute to the development of protocols that create a positive learning environment in the classroom.

**Managing personal learning**

At Level 3, students set short-term, achievable goals in relation to specific tasks. They complete short tasks by planning and allocating appropriate time and resources. They undertake some multi-step, extended tasks independently. They comment on task progress and achievements. They manage their feelings in pursuit of goals and demonstrate a positive attitude towards their learning.



# Civics and Citizenship

## Introduction

The Civics and Citizenship domain provides students with knowledge, skills and opportunities to understand and practise what it means to be a citizen in a democracy. Citizens require knowledge and understanding of civic institutions and the skills and willingness to actively participate in society. They need knowledge of political and legal systems and processes and the history that underpins them in order to achieve civic understanding. They need to understand their rights and responsibilities as citizens, and democratic values and principles such as democratic decision making, representative and accountable government, freedom of speech, equality before the law, social justice and equality. This domain facilitates the practice of citizenship skills, the exploration and development of values and dispositions to support citizenship and the empowerment of informed decision making. Teaching of civics engages students in active interaction with the community.

In a world where people, environments, economics and politics are inextricably linked, and where dislocation and change is accelerating, a strong sense of personal identity developed through participation in communities is a sound basis from which to connect with the world. Civics and Citizenship education strengthens understanding and valuing of the self. It teaches why citizens need a sense of personal identity within their own community and how they can contribute to local, national and global communities. Through Civics and Citizenship students develop an appreciation for the uniqueness and diversity of Australia's multicultural society and the efforts of individuals and groups to achieve political rights and equality. They value what it means to be an Australian and explore Australia's role in the global community. They consider human rights and social justice issues at local, national and global levels.

In Civics and Citizenship students investigate how, in a democratic tradition, informed and diverse contributions and participation by citizens are important. They learn about, contest and enact the values that are important to be an engaged citizen within a community. They are provided with opportunities to investigate and participate in activities that support sustainable practices, social justice and underpin the future wellbeing of societies from a local to a global level. Civics and Citizenship provides a vehicle for students to challenge their own and others' views about Australian society and to formally participate in and practise activities and behaviours which involve democratic decision making.

## Structure of the domain

The Civics and Citizenship domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 3, a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Civics and Citizenship, standards for assessing and reporting on student achievement apply from Level 3.

### Dimensions

Standards in the Civics and Citizenship domain are organised in two dimensions:

- Civic knowledge and understanding
- Community engagement.

#### Civic knowledge and understanding

The *Civic knowledge and understanding* dimension focuses on the principles and practices that underpin civic institutions and civic life in communities and societies. Students explore concepts of democracy and the key features of Australian and other democracies. They develop knowledge and understanding of the origins and key features of the Australian political, government and legal systems. They develop understanding of the origins, uniqueness and diversity of Australia's multicultural society. They learn about the principles and values which underpin Australian democracy, such as equality before the law, freedom of speech, democratic representation, accountability of government, social justice and respect for others. They explore the elements of sustainability in local, national and global contexts. They learn about the contribution

democracy has made to Australia's history and national identity and Australia's place in the world.

### Community engagement

The *Community engagement* dimension focuses on the development of skills and behaviours students need to interact with the community and to engage with organisations and groups. Students participate in processes associated with citizenship such as decision making, voting and leadership, using their knowledge of rules and laws of governance, and concepts such as human rights and social justice. They think critically about their own values, rights and responsibilities and those of organisations and groups across a range of settings, and explore the diversity in society.

Students explore and consider different perspectives and articulate and justify their own opinions on local, national and global issues. They refine their own opinions, values and allegiances. They apply their knowledge and skills in a range of community-based activities.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

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During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

# Level 3

## Learning focus

As students work towards the achievement of Level 3 standards in Civics and Citizenship, they build on their understanding of Australian society and investigate some of the different cultural groups, including Aboriginal and Torres Strait Islander (ATSI) communities, that make up the Australian community. They learn about the contributions that people from diverse groups have made to many aspects of the Australian way of life. This includes contributions to the arts, industry, medicine and science, as well as to other aspects of their life including food, festivals and sporting events. They explore the ways that Australians are connected to other regional and global communities.

Students learn about some key events which contributed to the development of the Australian nation. They explore symbols and celebrations of Australia's and Victoria's past and present; for example, the Australian national flag, the ATSI flags, the Victorian flag, coats of arms, floral emblems, colours, flower, animal and bird emblems, the national anthem, Australia Day and the Queen's Birthday. They consider the meaning and values that are reflected in these celebrations and symbols. They consider what they value about Australia.

Students explore how and why people make decisions and identify places where people come together to discuss issues and make decisions. They know that voting is a key method for group decision making in a democracy. Students learn about the purpose of government and some familiar services provided by government, particularly at the local level such as pre-schools, libraries, recreational facilities and waste and recycling collections. They look at the roles of some leaders and representatives such as prime minister, premier and mayor.

Students learn about the different types of groups in the community and their functions; for example, school groups and local volunteer groups such as charitable and environmental organisations. From their research, they develop knowledge about their community and environment, and a sense that individuals' contributions can care for and improve the environment, their own lives and the lives of others.

They explore the differences between rules and laws, why we have them, what role they serve, and how they can be changed. They contribute to the development and support of classroom rules. They develop an understanding of the qualities of good laws, the importance of laws applying equally to everyone in a democracy, and the ways that laws are made.

Students engage in democratic processes to plan and carry out activities and events at the school or in the local community. They participate in community,

school- and/or home-based projects designed to protect and care for the natural and built environment and promote the sustainable management of resources that they use; for example, by reducing, reusing and recycling paper and plastics, reducing use of fossil fuel by walking or cycling to school, reducing water consumption, and contributing to community events.

### **National Statements of Learning**

This learning focus statement, with the following elaborations and in conjunction with the Level 3 learning focus statements for Interpersonal Development, Communication and The Humanities, incorporates the Year 3 National Statement of Learning for Civics and Citizenship.

### **Elaborations:**

They explore the ways that Australians are connected to other regional and global communities.

Students explore how and why people make decisions and identify places where people come together to discuss issues and make decisions. They know that voting is a key method for group decision making in a democracy.

They explore the differences between rules and laws, why we have them, what role they serve, and how they can be changed. They contribute to the development and support of classroom rules. They develop an understanding of the qualities of good laws, the importance of laws applying equally to everyone in a democracy, and the ways that laws are made.

Students engage in democratic processes to plan and carry out activities and events at the school or in the local community. They participate in community, school- and/or home-based projects designed to protect and care for the natural and built environment and promote the sustainable management of resources that they use; for example, by reducing, reusing and recycling paper and plastics, reducing use of fossil fuel by walking or cycling to school, reducing water consumption, and contributing to community events.

## Standards

### **Civic knowledge and understanding**

At Level 3, students demonstrate understanding of the contribution of people from the many culturally diverse groups that make up the Australian community. They sequence and describe some key events in Australia's democratic history. They describe symbols and emblems of national life in Australia and identify values related to symbols and national celebrations and commemorations. They describe the purpose of government, some familiar government services and the roles of some leaders and representatives. They explain the difference between rules and laws and describe the qualities of a good law. They explain why protection and care for the natural and built environment is important.

### **Community engagement**

At Level 3, students contribute to the development and support of class rules and participate in school celebrations and commemorations of important events. They describe some of the roles and purposes of groups in the community. They work with other students to identify a local issue and plan possible actions to achieve a desired outcome. They describe the benefits of action at the local level and the democratic aspects of the process. They participate in activities to protect and care for the natural and built environment.

# Discipline-based Learning

The domains within the Discipline-based Learning strand form a body of knowledge with associated ways of seeing the world and distinct methods of exploring, imagining and constructing that world.

Broadly in line with academic literature and consistent with practice in many schools, the Victorian Essential Learning Standards identify the Arts, the Humanities, English and Languages Other Than English, Mathematics and Science as the disciplines for the curriculum over the stages of learning from Prep to Year 10.

Within the Discipline-based Learning strand the learning domains are:

- The Arts
- English
- The Humanities – Economics
- The Humanities – Geography
- The Humanities – History
- Languages Other Than English (LOTE)
- Mathematics
- Science

Students who develop a deep understanding of the concepts contained in the discipline-based domains are able to apply their knowledge in many different ways. The degree to which they are able to transfer their knowledge depends largely on the degree to which students have achieved mastery over Physical, Personal and Social and Interdisciplinary learning.

Research suggests that students develop deeper understanding of discipline-based concepts when they are encouraged to reflect on their learning, take personal responsibility for it and relate it to their own world. These approaches are explicitly defined in the Physical, Personal and Social Learning domains such as physical education and personal learning.

Students are better able to develop, demonstrate and use discipline-based knowledge and skills when they are able to employ interdisciplinary knowledge, skills and behaviours described in the domains of Communication; Design, Creativity and Technology; Information and Communications Technology; and Thinking Processes.

# The Arts

## Introduction

The Arts are unique, expressive, creative and communicative forms that engage students in critical and creative thinking and help them understand themselves and the world. In every society the Arts play a pivotal role socially, economically and culturally. The Arts encourage the development of skills and the exploration of technologies, forms and processes through single and multimodal forms. They fuel the exploration of ideas that cross the gamut of human emotions and moods through holistic learning using cognitive, emotional, sensory, aesthetic, kinaesthetic and physical fields.

The Arts domain encompasses a diverse and ever-changing range of disciplines and forms that can be used to structure teaching and learning programs. The domain allows students to create and critically explore visual culture, performances in contemporary and traditional genres, and works that involve the fusion of traditional forms with digital media. Schools use the arts disciplines of Art, Dance, Drama, Media, Music and Visual Communication to plan programs. These programs reflect the cultural diversity of students and school communities and the vast growth in information and communications technology that has made arts forms increasingly visible. They recognise the multicultural world saturated with imagery, sounds and performances that students inhabit. Engagement in the Arts involves the inspired and passionate exploration of ideas and the resultant products and performances. By their very nature, the Arts nurture cultural understanding, invention, new directions and new technology. Imagination and creativity, pivotal to the Arts, are essential to our wellbeing because we create much of our world in order to enhance our experiences and understandings of the diverse perspectives that constitute our cultural heritage. For students, interaction through the Arts brings contact with the Indigenous cultures of Australia and the cultures of our nearest neighbours.

Learning in the Arts allows students to communicate their perceptions, observations and understanding of structures, functions and concepts drawn from other areas of the curriculum. The Arts are a vehicle for confronting and exploring new ideas. Through learning in the Arts, students prepare for their roles in a post-industrial economy that depends on innovative ideas, creative use of technologies and the development of new and blended forms. Arts learning expects ethical conduct in the creating, making, presenting and responding to arts works; for example, adherence to agreed approaches by individuals in a collaborative performance or acknowledgment of the use of other artists' products.

Learning in the Arts is sequential and students should have continuous

Definitions of underlined terms are provided in the Glossary (page 95)



experience in the different arts disciplines they undertake at a particular level. At Levels 1, 2 and 3 all students should experience learning in Performing Arts (Dance, Drama and Music) and Visual Arts (Art, including two-dimensional and three-dimensional, and Media) disciplines and forms. The arts disciplines may be offered by schools individually and/or in combination; for example, in a cross-disciplinary manner or using new arts forms that combine traditional arts disciplines. At Levels 4 and 5, the study of a range of arts disciplines broadens and deepens students' understanding of the Arts as an area of human activity and provides increased opportunities for personal expression and communication. All students should have continuous experience in at least two arts disciplines at each of these levels. At Level 6, learning programs should provide opportunities for students to continue sequential development of learning in the arts disciplines they have undertaken at Levels 4 and 5. Opportunities should also be provided for students to explore personal interests and develop skills, knowledge and understanding relevant to specific arts forms and disciplines in increasingly sophisticated ways.

At all levels, learning programs in the arts disciplines should provide opportunities for students to experience a range of traditional, contemporary (including digital) and new media/multi-disciplinary forms and genres.

## Structure of the domain

The Arts domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and a set of standards. A glossary is included which provides definitions of or information about underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities. Advice regarding the range of arts disciplines that students should experience is included as an introduction to each learning focus statement.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In the Arts, standards for assessing and reporting on student achievement apply from Level 1.

## Dimensions

Standards in the Arts domain are organised in two dimensions:

- Creating and making
- Exploring and responding.

Standards for the *Exploring and responding* dimension are introduced from Level 3.

The frames of reference – interpreting, responding, performing, presenting, ideas, skills, techniques, processes, context, aesthetics and criticism – are integral to both dimensions as *Exploring and responding* draws on students' experiences as creators, makers, performers and/or audience.

Advice will be published for each arts discipline to accompany the standards.

### Creating and making

The *Creating and making* dimension focuses on ideas, skills, techniques, processes, performances and presentations. It includes engagement in concepts that emerge from a range of starting points and stimuli. Students explore experiences, ideas, feelings and understandings through making, interpreting, performing, creating and presenting. Creating and making arts works involves imagination and experimentation; planning; the application of arts elements, principles and/or conventions; skills, techniques and processes; media, materials, equipment and technologies; reflection; and refinement. Individually and collaboratively, students explore their own works and works by other artists working in different historic and cultural contexts.

### Exploring and responding

The *Exploring and responding* dimension focuses on context, interpreting and responding, criticism and aesthetics. It involves students analysing and developing understanding about their own and other people's work and expressing personal and informed judgments of arts works. Involvement in evaluating meaning, ideas and/or content in finished products is integral to engagement in the Arts.

Exploration of, and response to, expressive qualities of arts works is informed by critical analysis of the use of elements, content and techniques and discussion about the nature, content, and formal, aesthetic and/or kinaesthetic qualities of arts works. Exploring the qualities of arts works involves use of arts language and also draws on research into the purposes and functions for which the works are created and audiences to whom they are presented. This involves students developing an understanding of social, cultural, political, economic and historic contexts and constructs, and developing a consideration of ways that arts works reflect, construct, reinforce and challenge personal, societal and cultural values and beliefs.

Definitions of underlined terms are provided in the Glossary (page 95)

## National Statements of Learning

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## Level 3

All students should experience learning in the disciplines and forms of the Performing Arts (Dance, Drama and Music) and Visual Arts (Art: two-dimensional and three-dimensional, and Media). Learning and teaching programs at this level involve these arts disciplines individually (for example Visual Arts – Art: two-dimensional and three-dimensional), or in combination (for example, Dance and Drama, or Media and Music).

### Learning focus

As students work towards the achievement of Level 3 standards in the Arts, they apply and develop their arts knowledge by exploring arts processes and ways to communicate concepts arising from their personal experiences and from the world around them. Through the arts disciplines of Dance, Drama, Media, Music and Visual Arts – Art (two-dimensional and three-dimensional), both individually and in combination, they communicate ideas, observations and feelings using a range of media, materials, equipment and technologies to make arts works; for example, a class presentation could feature the performance of a song from another culture in combination with a traditional

Definitions of underlined terms are provided in the Glossary (page 95)

dance and/or accompanied by a slide-show presentation featuring paintings and carvings which explore the theme of the song.

Students select, combine and experiment with ways of using a range of arts elements, principles and/or conventions, skills, techniques and processes, to explore arts ideas sourced from their imagination and from their own and other cultures. With guidance they record the development of ideas; for example, in a visual diary or a digital (audio or screen) journal with records of rehearsals and conversations about the ideas/work they are developing. Students consider the purpose and audience of their arts works as they experiment with various ways of presenting works in a range of arts forms, and begin to evaluate and refine their work in response to feedback. For example:

- in Art, students look at and talk about examples of weaving from various cultures, then explore the potential of weaving techniques and processes to create pattern, repetition and contrast using a range of media
- in Dance, students create a movement sequence based on ideas and feelings suggested by one or more images viewed in class, then modify their work in response to feedback from other students in the class
- in Drama, students discuss the possibilities of communicating without words then create tableaux based on image/s, to suggest what may have happened before and after what is depicted in the image/s
- in Media, students plan, record and edit an interview with someone of interest (or curiosity) to them, then present their work and discuss ideas about it in class
- in Music, with a journey to an imaginary world in mind, students create sound pictures that show variation in rhythmic patterns and contrasts in pitch and duration.

As they explore and respond to their own and others' arts works, students develop skills, techniques and processes for expressing emotions and ideas, and signifying purpose. Using appropriate arts language they begin to identify and describe ways they and others use specific elements, principles and/or conventions, skills, techniques and processes and discuss how ideas, feelings and purpose are conveyed. They reflect on their own and other people's arts works and ideas, identifying key features of works and performances from their own and other cultures, and discuss the function of the Arts in their community.

Further examples of arts discipline-specific learning approaches for Level 3 will be available on the Standards website at <<http://vels.vcaa.vic.edu.au>> in 2006.

## Standards

### Creating and making

At Level 3, students create and present works in a range of arts forms that communicate experiences, ideas, concepts, observations and feelings. They select and combine a range of arts elements, principles and/or conventions, and use a range of skills, techniques and processes, media, materials, equipment and technologies. They show evidence of arts knowledge when planning arts works for different purposes and audiences and identify techniques and features of other people's works that inform their own arts making. They refine their work in response to feedback and self-evaluation.

### Exploring and responding

At Level 3, students comment on the exploration, development and presentation of their arts works, including the use of specific arts elements, principles and/or conventions, skills, techniques and processes. They identify and describe key features of arts works from their own and other cultures, and use arts language to describe and discuss the communication of ideas, feelings and purpose in their own and other people's arts works.

# English

## Introduction

### LEVEL 3

In the English domain, *texts* and *language* constitute the central and essential concepts. The concept of texts focuses equally on creating and analysing texts, understanding and interpreting *texts*, and moving beyond interpretation to reflection and critical analysis. The concept of *language* includes the use of language and the development of linguistic competence, and the development of knowledge about language.

Students learn to appreciate, enjoy and use language and develop a sense of its richness and its power to evoke feelings, to form and convey ideas, to inform, to discuss, to persuade, to entertain and to argue.

The English domain is centred on the conscious and deliberate study of language in the variety of texts and contexts in which it is spoken, read, viewed and written. It is concerned with a wide range of written and spoken texts in print and electronic forms including literary texts such as novels, short stories, poetry, plays and non-fiction; film and other multimodal texts; media texts; information, commercial and workplace texts; everyday texts; and personal writing.

The study of English involves students in reading, viewing, listening to, writing, creating, comparing, researching and talking about a range of text types from the simple to the complex, from texts dealing with concrete and straightforward information to those dealing with increasingly complex and abstract issues and ideas. English teachers encourage students to explore the meaning of texts and how meaning is conveyed. They introduce critical approaches to the ideas and thinking contained in texts and support students in the development of critical understanding about the ways writers and speakers control language to influence their listeners, readers and viewers.

Students develop an understanding of the way purpose, audience and situation influence the structures and features of language and learn to apply their knowledge in their reading, writing, viewing, speaking and listening. They come to understand that different kinds of texts are appropriate for different occasions and learn to appreciate the variety of English usage in different times and places. They also learn about the ways language shapes and reflects attitudes in different times and places. Students are provided with opportunities to use language effectively in a range of contexts from informal to formal.

Students learn terminology or metalinguage to describe and discuss particular structures and features of language produced in a variety of contexts. They learn to control language by applying their understanding of the grammatical

Definitions of underlined terms are provided in the Glossary (page 95)

structures of Standard Australian English, by learning to spell accurately and use punctuation effectively, as well as by imitating good writers and speakers.

Understanding texts and recognising how language works within them is necessary for success at school and beyond for an active, informed and fulfilling life in modern Australian society and the global community. By understanding and working with texts, students acquire the knowledge, skills and personal qualities that enable them to read, view and listen critically and to think, speak and write clearly and confidently.

## Structure of the domain

The English domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and a set of standards organised by dimension. A glossary is included which provides definitions of or additional information about underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In English, standards for assessing and reporting on student achievement apply from Level 1.

### Dimensions

Standards in the English domain are organised in three dimensions:

- Reading
- Writing
- Speaking and listening.

The learning in these dimensions is interrelated. For example, speaking and listening contribute to the development of students' reading responses. Writing contributes to communication about texts read or viewed and to reflection and learning. To help support student progress in all three dimensions, learning contexts are diverse and include situations that are informal, formal, planned and spontaneous.

### Reading

The *Reading* dimension involves students understanding, interpreting, critically analysing, reflecting upon, and enjoying written and visual, print and non-print texts. It encompasses reading and viewing a wide range of texts and media, including literary texts such as novels, short stories, poetry and plays as well as popular fiction and non-fiction works, newspapers and magazines, illustrations, posters and charts, film and television and the texts associated with information and communications technology. Reading involves active engagement with texts and the development of knowledge about the relationship between them and the contexts in which they are created. It also involves the development of knowledge about a range of strategies for reading.

### Writing

The *Writing* dimension involves students in the active process of conceiving, planning, composing, editing and publishing a range of texts including writing for print and electronic media and performance. Writing involves using appropriate language for particular purposes or occasions, both formal and informal, to express and represent ideas, issues, arguments, events, experience, character, emotion and information and to reflect on such ideas. It involves the development of knowledge about strategies for writing and the conventions of Standard Australian English. Students develop a metalanguage to discuss language conventions and use.

### Speaking and listening

This dimension refers to the various formal and informal ways oral language is used to convey and receive meaning. It involves the development and demonstration of knowledge about the appropriate oral language for particular audiences and occasions, including body language and voice. It also involves the development of active-listening strategies and an understanding of the conventions of different spoken texts including everyday communication, group discussion, formal presentations and speeches, storytelling and negotiating.

## Learners of English as a Second Language

Many students in Victorian schools learn English as a Second Language (ESL). They are of all ages and at all stages of learning English and have varying educational backgrounds in their first languages. While the broad objectives of English programs will ultimately be the same for all students, those learning English as a Second Language need time, support and exposure to English before being expected to reach the standards described in the English domain, and will come to this achievement via a range of pathways.

Definitions of underlined terms are provided in the Glossary (page 95)



Standards have been developed to assist teachers to devise effective learning and assessment programs for ESL students. The document includes an overview of the broad stages of English language development with learning focus statements and standards for each stage. The standards for ESL students are available at <<http://vels.vcaa.vic.edu.au/support/esl/esl.html>>.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

The Statements of Learning were developed as a means of achieving greater national consistency in curriculum outcomes across the eight Australian states and territories. It was proposed that they be used by state and territory departments or curriculum authorities (their primary audience) to guide the future development of relevant curriculum documents. They were agreed to by all states and territories in August 2006.

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## National Literacy Benchmarks

National Literacy Benchmarks are used for reporting achievement in three aspects of literacy – reading, writing and spelling – at Years 3, 5 and 7. The benchmarks define nationally agreed minimum acceptable standards for literacy at these years.

Full details of the National Literacy Benchmarks are available in *Literacy Benchmarks Years 3, 5 and 7, Writing, Spelling and Reading*, Curriculum Corporation, 2000 at <[www.curriculum.edu.au/projects/numbench.php](http://www.curriculum.edu.au/projects/numbench.php)>.

The benchmarks describe minimum standards. For this reason, the Year 3 benchmarks relate to Level 2 English standards, the Year 5 benchmarks relate to Level 3 English standards and the Year 7 benchmarks relate to Level 4 English standards. Links to the literacy benchmarks are located in the English standards.

# Level 3

## Learning focus

As students work towards the achievement of Level 3 standards in English, they speak, listen, read and write with some critical awareness, using a growing variety of text types and show some appreciation of the role of formal discourses in English.

Students read an increasing range of texts including imaginative texts such as chapter books, junior novels and poems, as well as informative texts, in print and electronic form. Texts typically have varied sentence patterns, written language structures and some specialised topic-related or literary vocabulary, and ideas and information extending beyond students' immediate experience. Students use a range of strategies to interpret the main ideas and purpose of texts – for example, interpreting figurative language or linking information from headings – and explore characters' qualities, motives and actions. Through discussion, students develop their understanding of why interpretations of a text may vary, and how the choice of subject matter is influenced by context, the author's purpose, and the intended audience. They read more critically and learn about the use of some simple symbolic meanings and stereotypes in texts.

Students develop confidence in writing a range of imaginative and informative texts, including simple narratives and descriptions, and texts that explain, inform and express a point of view. They draw on their knowledge of texts and language and learn to use a variety of sentences in appropriate grammatical order, using suitable vocabulary for the subject matter including nouns, verbs, adjectives and adverbs, and punctuating appropriately to support meaning including exclamation marks and quotation marks. They learn to spell most one- and two-syllable words with regular spelling patterns (for example, *growing*, *found*, *might*), frequently used words which have less regular spelling patterns (for example, *because*, *there*, *friends*), and some other words of more than one syllable (for example, *yesterday*, *afternoon*, *money*). They make plausible attempts at spelling new and more difficult words. They experiment with combining verbal and visual elements to enhance the texts they produce.

Students develop strategies for writing to assist in planning and organising ideas prior to writing, and adapt their writing to suit their audience and purpose. They learn to use a range of resources, including information and communications technology, to revise written work and check spelling.

Students recognise that speaking and listening provide opportunities to exchange information, to share and explore ideas, and to express opinions and listen to the opinions of others. They participate in discussions, conversations and presentations in small and large groups, learning to vary their speaking

Definitions of underlined terms are provided in the Glossary (page 95)

and listening to suit the context, purpose and audience. In spontaneous, planned and rehearsed situations they learn how to project their voice adequately for an audience and to use appropriate spoken language features such as sequence and past tense when recounting an event. When speaking, they recognise the need to rephrase statements to clarify meaning and information.

Students develop skills in listening attentively during class and group discussions, and to factual spoken texts such as audio, film and invited presentations. They practise identifying the topic, retelling information accurately, asking clarifying questions, volunteering information and justifying opinions.

### **National Statements of Learning**

This learning focus statement, in conjunction with aspects of the Communication Level 3 learning focus statement, incorporates aspects of the Year 3 National Statement of Learning for English.

## **Standards**

### **Reading**

At Level 3, students read and respond to an increasing range of imaginative and informative texts with some unfamiliar ideas and information, vocabulary and textual features. They interpret the main ideas and purpose of texts. They make inferences from imaginative texts about plot and setting and about characters' qualities, motives and actions. They infer meaning from material presented in informative texts. They identify how language is used to represent information, characters, people, places and events in different ways including identification of some simple symbolic meanings and stereotypes. They use several strategies to locate, select and record key information from texts.

### **Writing**

At Level 3, students write texts containing several logically ordered paragraphs that express opinions and include ideas and information about familiar topics. They write narratives which include characters, setting and plot. They order information and sequence events using some detail or illustrative evidence, and they express a point of view providing some information and supporting detail. They combine verbal and visual elements in the texts they produce. They meet the needs of audiences by including appropriate background information.

They write a variety of simple and compound sentences and use verb tenses correctly. They use punctuation to support meaning, including exclamation marks and quotation marks, and accurately use full stops, commas and question marks. They use vocabulary appropriate to context and spell most one- and two-syllable words with regular spelling patterns, and frequently used words which have less regular spelling patterns. They use sound and visual patterns when attempting to spell unfamiliar words.

**Speaking and listening**

At Level 3, students vary their speaking and listening for a small range of contexts, purposes and audiences. They project their voice adequately for an audience, use appropriate spoken language features, and modify spoken texts to clarify meaning and information.

They listen attentively to spoken texts, including factual texts, and identify the topic, retell information accurately, ask clarifying questions, volunteer information and justify opinions.

**Year 5 National Literacy Benchmarks**

The benchmarks describe minimum standards. For this reason, the Year 5 benchmarks relate to Level 3 English standards. Links to the literacy benchmarks are located at <[www.curriculum.edu.au/projects/numbench.php](http://www.curriculum.edu.au/projects/numbench.php)>.

# The Humanities

## Introduction

The Humanities in Prep to Year 10 involve the study of human societies and environments, people and their cultures in the past and the present. The Humanities provide a framework for developing in students the key ideas and concepts that enable them to understand the way in which people and societies have organised their world under particular conditions and made meaning of it.

The Humanities take as their subject matter human behaviour. They provide unique ways to understand how and why groups of people have settled where they have, organised their societies, developed means of generating and distributing wealth, developed codes, laws and belief systems, related to other groups of people and interacted with their physical environment.

The Humanities encourage use of research skills and inquiry processes. Students learn to plan an investigation and ask key questions. They question and analyse a range of data and sources including artefacts, photographs, maps, stories, special events, interviews, site visits and electronic media. They form conclusions supported by evidence and present information in a variety of ways.

## Structure of the The Humanities

The Humanities discipline is organised into four domains:

- The Humanities – (Levels 1–3)
- The Humanities – History (Levels 4–6)
- The Humanities – Geography (Levels 4–6)
- The Humanities – Economics (Levels 4–6).

During Levels 1 to 3, students are introduced to basic concepts related to history, geography and economics under a general umbrella of 'The Humanities'. Each level includes a learning focus statement with standards introduced from Level 3. Specific learning focus statements and standards for Economics, Geography and History are introduced at Level 4.

The following table provides a summary of the structure of the Humanities.

DOMAIN	DIMENSION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6
<b>The Humanities</b>	Humanities knowledge and understanding	Learning focus statement only			Not applicable		
	Humanities skills						
<b>The Humanities – Economics</b>	Economic knowledge and understanding	Not applicable					
	Economic reasoning and interpretation						
<b>The Humanities – Geography</b>	Geographical knowledge and understanding						
	Geospatial skills						
<b>The Humanities – History</b>	Historical knowledge and understanding						
	Historical reasoning and interpretation						

Shaded boxes represent levels in each domain that have formal standards against which student achievement will be assessed and reported.

A glossary is included which provides definitions of underlined terms (see page 95).

## Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

## Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. Standards that focus on historical and geographical knowledge and understanding are introduced at Level 3. Specific standards for Economics, Geography and History are introduced at Level 4.

## Dimensions

Standards in the Humanities are organised in two dimensions:

- Humanities knowledge and understanding
- Humanities skills.

### Humanities knowledge and understanding

The *Humanities knowledge and understanding* dimension focuses on key humanities knowledge and concepts. Students learn about their immediate and local community and environment and are introduced to the history and geography of their country and the diversity of culture and environment. Through structured activities they learn the concepts of time – chronology and sequencing, change and continuity – and spatial concepts of location, distance, scale and distribution.

### Humanities skills

The *Humanities skills* dimension focuses on the development of basic inquiry skills including observation, the collection of various types of evidence, asking and answering questions about evidence and presenting information in a variety of ways.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

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Definitions of underlined terms are provided in the Glossary (page 95)

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELs. In the majority of cases, the VELs learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELs learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in the Humanities, they apply the concepts of time, continuity and change through a study of the history and traditions of Australians. They examine stories, artefacts and other evidence from the past and present to learn about Australian society and its origins, such as the history of national symbols, including the flag, and key commemorations and celebrations such as Anzac Day and Labour Day. They examine the histories of the cultural groups represented in their classroom, community and nation. They learn to sequence some key events on a timeline and write simple explanations of events.

Students investigate the human and physical characteristics of their local area and other parts of Victoria and consider features of their local community that have changed over time. They learn about settlement patterns, major land uses, communication networks, and the location and variety of national parks in Victoria. They begin to make some simple comparisons between local and other Victorian environments: natural features, climate, land use and types of human activities. Students develop awareness and understanding of the effects of people's interactions with their environment and the ways in which these affect their lives. Students begin to visualise and describe location and direction using simple alphanumeric grids and compass points. They learn to use atlas maps and a globe to locate and name the states and territories of Australia.

Students learn to distinguish between basic needs and wants (for example, food, clothing, shelter, and affection), saving and spending, buyers (consumers) and sellers (producers), and goods and services. They develop an understanding of the role of money and identify ways to save; for example, using a savings account, and begin to understand the importance of budgeting. They examine and compare different types of work and specific jobs.

Definitions of underlined terms are provided in the Glossary (page 95)



## Standards

### Humanities knowledge and understanding

At Level 3, students describe and sequence some key events in Australian history, some key commemorations and celebrations including Anzac Day, and key aspects of the histories of cultural groups that make up their class, community and nation. They describe how aspects of places in their local area have changed over time. From direct observation or observation of a variety of media, they describe the human and physical characteristics of their local area and other parts of Victoria. They describe how people use and affect different environments in Victoria.

### Humanities skills

At Level 3, students use a range of historical evidence, including oral history, artefacts, narratives and pictures, to retell events and describe historical characters. They develop simple timelines to show events in sequence. They explain some of the differences between different types of historical evidence, and frame questions to further explore historical events. Students draw simple maps and plans of familiar environments observing basic mapping conventions. They identify the location of places on a simple map using an alphanumeric grid and describe direction using the four cardinal compass points. Using atlas maps and a globe, they locate and name the states and territories of Australia.

# Languages Other Than English

## Introduction

Languages Other Than English (LOTE) contribute materially to the universal purposes of schooling and to the development of skills in thinking and reflection. They support the moral, social and economic initiation of young people into the culture and wider civilisation that surrounds them. Learning a language nurtures reflective, deep and creative thinking in specific ways, cultivates culturally distinctive fields of knowledge, and stimulates awareness of intellectual functioning. In unique ways, languages require learners to engage in self-reflection because effective communication in a new language requires the learner to move outside the norms, practices and acquired behaviours of their first language.

Languages infuse the entire curriculum with both taught and incidental insights into how knowledge is organised by different sociocultural communities, and introduce awareness of important distinctions in meaning, sound, and sound patterns, social arrangements, order and sequencing of information, categories and relations. These skills can directly enhance the general intellectual development of young people.

In learning a language, students develop communication skills and knowledge and come to understand social, historical, familial relationships and other aspects of the specific language and culture of the speakers of the language they are studying. Learners are also provided with the tools, through comparison and reflection, to understand language, culture and humanity in a broad sense. In this way, language learning contributes to the development of interculturally aware citizens, of increasing importance at a time of rapid and deep globalisation.

## Structure of the domain

The LOTE domain is organised into two pathways, the first consisting of six levels and the second of two levels. Each level includes a learning focus statement and a set of standards organised by dimension from Level 4 in Pathway 1 and Level 5 in Pathway 2.

### Pathways

As students may begin their LOTE studies at different stages, learning focus statements and standards are offered for two pathways which recognise the student's point of entry into the study:

**Pathway 1:** for students who begin learning a language in primary school and continue to study the same language to Year 10.

**Pathway 2:** for students who begin learning a language in Year 7.

## Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

## Standards

Standards define what students should know and be able to do at different levels and are written for each dimension.

In LOTE standards are introduced for assessment and reporting at Level 4. While it is clear that students gain most benefit from the study of another language when they begin this study in the early years, it is acknowledged that some schools choose to maximise the effect of their resources by introducing LOTE programs at different year levels with appropriate time allocations. In recognition of the cumulative nature of language learning, the LOTE domain includes progression measures (see Level 4 booklet) which provide a typical sequence of second language development leading to Level 4. Regardless of the level at which the study of a language other than English is introduced, students will need to develop the knowledge and skills described in the progression measures before they attempt the learning associated with the Level 4 standards. These progression measures also assist schools that provide LOTE programs prior to Years 5 and 6 to assess and report effectively on student achievement.

Standards relevant to each of the six language categories appear beside an icon (see language categories, page 53) from Level 4 onwards.

## Dimensions

This domain has two dimensions:

- Communicating in a language other than English
- Intercultural knowledge and language awareness.

The two dimensions of the LOTE domain are intimately linked. *Communicating in a language other than English* allows learners to reflect on language as a system and gain cultural insight. In turn, *Intercultural knowledge and language awareness* can provide cultural guidelines for effective communication.

### Communicating in a language other than English

In the *Communicating in a language other than English* dimension, students learn the knowledge, skills and behaviours relevant to the specific language being studied. The skills of this dimension include listening, speaking, reading, viewing, writing, and the use of body language, visual cues and signs. The application of these skills requires knowledge of linguistic elements, including

vocabulary and grammar. This dimension requires familiarity with a wide variety of texts and genres in print and electronic form.

### **Intercultural knowledge and language awareness**

Communication skills in a language other than English foster intercultural knowledge and awareness of language as a system. The *Intercultural knowledge and language awareness* dimension develops students' knowledge of the connections between language and culture, and how culture is embedded throughout the communication system. Progress through this dimension is demonstrated through performance in the language being studied. The understandings are universal and are gained by comparing languages, including English.

Students gain an awareness of the influence of culture in the learner's own life and first language. Different languages and language communities organise social relations and information in different ways and values differ from one community to another. Through cultural self-awareness, the ability to rationally discuss and compare cultural differences is developed. This dimension involves developing curiosity about and openness to a variety of values and practices, as well as acquiring in-depth knowledge of the diverse cultural traditions of the source societies.

### **Language categories**

For the purposes of organising the learning demands on students, languages can be broadly grouped into six categories. Standards in the *Communicating in a language other than English* dimension include an initial section common to the Roman alphabetical, Non-Roman alphabetical, Character and Sign language categories and additional standards specific to each of these language categories. For Classical languages the complete standard is provided in the language category description. The standards, learning focus statements and protocols for teaching Aboriginal Languages appear in a separate booklet available for download from the VELS website (<http://vels.vcaa.vic.edu.au/aboriginal>).

- A Roman alphabetical languages** – languages whose writing system, or means of being visually recorded, is Roman alphabetic, and whose reading demands on learners are similar to those of English (examples include: French, German, Indonesian, Italian, Spanish, Vietnamese).
- Ω Non-Roman alphabetical languages** – languages whose writing system is alphabetic but non-Roman, and for which a learner needs to acquire a new alphabet (examples include: Arabic, Greek, Hebrew and Russian).
- 字 Character languages** – languages whose writing system is either syllabic, ideographic, or a combination of syllables and ideograms, involving different reading processes from alphabet reading, and the learning of the new script (examples include: Chinese, Japanese).



**Sign language** – Australian Sign Language, or Auslan. For most learners this will also involve reading in English.



**Classical languages** – ancient languages not used as a means of everyday communication by a contemporary community. Consisting of Roman alphabetical languages (for example, Latin) and non-Roman alphabetical languages (for example, Classical Greek). Standards in this category apply only in Pathway 2 Levels 5 and 6.



**Aboriginal languages** – Victorian Aboriginal Languages which involve the process of reclamation and the study of culture. Schools should follow the processes outlines in the *Aboriginal Languages, cultures and reclamation in Victoria schools: standards P–10 and protocols* booklet prior to incorporating this language category in their teaching programs. The booklet can be downloaded from the VELs website (<http://vels.vcaa.vic.edu.au/aboriginal>).

## Transition

Studies of LOTE are offered in a range of ways in schools. While studying one language other than English from Prep to the Victorian Certificate of Education (VCE) is ideal, some students change languages in the transition from primary to secondary schooling.

The development of the knowledge and skills acquired in the *Intercultural knowledge and language awareness* dimension is cumulative and continuity is maintained despite any change in the language studied. However, the *Communicating in a language other than English* dimension relates directly to knowledge and skills in a specific language.

## Background speakers

Many students bring an in-depth knowledge of another language to the classroom. Some of these students will have a language other than English as their first language and others may have lived in a country where the language is spoken. These students may progress more rapidly through some aspects of the standards in one or both dimensions.

# Languages Other Than English – Pathway 1

## Introduction

The language curriculum is organised through themes and topics which are arranged to provide progressive and cumulative opportunities for students to develop language and cultural understandings. Themes and topics form the main organising principle for language study. The sequencing of activities and language content allows learners to build new skills, knowledge and attitudes on the levels they have already attained. This cumulative process supplies continuity and sequence to the learner and coherence for the teacher.

Four principles should guide the selection of topics:

1. Topics that are culturally, socially or linguistically distinctive to the particular language concerned. This will vary for different languages.
2. Topics that extend or reinforce or complement topics already covered and that permit an extension of the language expectations.
3. Topics that are relevant and of interest to the students.
4. Topics that integrate with themes, topics, or key areas being addressed in other domains.

All topic selection should be governed by its potential to contribute to systematic acquisition of the language and cultural understandings in one or both of the dimensions.

Opportunities must be provided for students to demonstrate not only their communicative competence, but also their intercultural understandings and language awareness, through practical applications of the language.

Within each theme and topic, time is devoted to the acquisition of new language, structures, communication conventions, ways of thinking about the topic/s and their expression, as well as comparisons between languages and cultures.

### Years Prep to 4

Students study language through themes and topics that introduce the key idea of the language domain: that many societies and many people within Australia normally use languages other than English for communication.

The dimensions are integrated to provide opportunities for students to exchange information and ideas based on the theme and topic, and the individual student's language competence at this level.

Activities that are appropriate at these levels may vary. The particular writing system used in the language being studied will affect the emphasis of the activities.

## Years 5 to 8

Students build language cumulatively by expanding language and cultural understandings they already have. The awareness that languages other than English are the normal means of communication for many societies and people is reinforced.

Themes and topics are selected and sequenced to allow learners to build new skills, knowledge and attitudes and are culturally, socially and linguistically appropriate for the particular language being taught. The topics contribute to systematic acquisition of the language and cultural understandings in both dimensions in an integrated way. Topics should be of interest to students at these levels and most topics should be familiar to them. They may be productively integrated with themes, topics, or key areas being addressed in other areas of the curriculum.

Teaching activities are diverse and aim to consolidate language and cultural understandings, and use a diverse range of materials and genres, texts and media in defined contexts.

Some students change languages in the transition between primary and secondary schooling. For information about the stages of learning for students in this situation, please refer to the information for Pathway 2 (see page 31).

## Years 9 to 10

Students participate in communication forums as competent members of the target-language-speaking community.

Themes and topics are selected because of their potential to contribute to systematic acquisition of the language and cultural understandings in both dimensions. Most topics will be familiar to students, should relate to their interests, and provide opportunities for deep investigation of issues, drawing on skills and knowledge acquired in other areas of the curriculum.

Students are encouraged to research and create their own contexts for demonstrating their language and cultural understandings. They use a range of learning tools, including multimedia tools, to encounter a wide range of language and cultural forms and practices. Both directed and independent learning is focused on acquisition of new language, structures, communication conventions, ways of thinking about the topic/s and their expression, as well as comparisons between languages and societies.

Teaching activities are diverse and consolidate language and cultural understandings, encourage risk-taking, and use many materials and genres, texts and media.

# Pathway 1 Level 3

## Learning focus

As students work towards the achievement of standards in LOTE at Pathway 1 Level 4, they begin to understand and use the language other than English in relation to their personal world, countries where the language is spoken (for example, its geography, history, aspects of shopping) and the world of the imagination. They begin to collect information in the language (for example, from the Internet or from modified texts). They start to explore the beliefs and lifestyles of people from other countries who now live in Australia. In preparation for Level 4 standards, students need to develop the knowledge and skills described in the progression measures (see Level 4 booklet).

Students consolidate previously learnt language and extend their personal vocabulary and knowledge of language structures. They read short texts, talk about daily life and adapt language that they know to new contexts.

They discern patterns and make connections between the language and English (and possibly other languages) and understand that there are rules, some of which are common across languages and some that are not.

Students experience a wide range of voices and settings where the language is used, including extended passages in both oral and written form; for example, simple stories, legends, songs and rhymes. They collect information about the settings, countries and regions where the language is spoken. Through this and other stimulus material, students are encouraged to reflect on life in these countries, as well as their own.

Students are encouraged to identify a range of natural contexts for the use of the language, and the specific features of communication in these contexts. They recognise the use of the language in information and communications technology applications and experience it in multimedia computer texts.

They make links between knowledge about relevant geography and history, or ways of thinking about specific topics/issues (for example, number systems, bargaining or haggling when shopping, the influence of social relationships) and their understanding of the language and its use.

They use simple software applications to demonstrate understanding of known vocabulary and structures. They participate in very simple interpreting and translating routines.

Students communicate relying on models and with ongoing teacher support and scaffolding. They experiment with language and express themselves by approximating meaning.



## Standards

In LOTE Pathway 1, standards for assessing and reporting achievement are introduced at Level 4. Schools that provide language programs prior to Level 4 should refer to the LOTE progression measures (see page Level 4 booklet) which provide a typical sequence of second language development. The Levels 1, 2 and 3 learning focus statements provide advice for teachers about learning experiences that will assist students to work towards the achievement of the standards at Level 4.



The learning focus statements and standards for the language category Aboriginal Languages are different to those written for the other five language categories. These are contained in the *Aboriginal Languages, cultures and reclamation in Victorian schools: standards P–10 and protocols* booklet available from the VELS website (<http://vels.vcaa.vic.edu.au/aboriginal>).

# Mathematics

## Introduction

Mathematics is a human endeavour that has developed by practice and theory from the dawn of civilisation to the present day. Many societies and cultures have contributed to the growth of mathematics, often in times of scientific, technological, artistic and philosophical change and development. Complementary to this broad perspective of mathematics are the various mathematical practices that take place day to day in communities around the world.

While the usefulness of mathematics for modelling and problem solving is well known, mathematics also has a fundamental role in enabling cultural, social and technological advances, and empowering individuals as critical citizens in contemporary society and for the future. Number, space and measurement, and chance and data are common aspects of most people's mathematical experience in everyday personal, study and work situations. Equally important are the essential roles that mathematical structure and working mathematically play in people's understanding of the natural and human worlds.

Mathematics can be described in terms of its objects, what they are and how they came to be; its established body of knowledge and why this is held to be true; its effective application in science, technology and other domains; and the practice and activities of mathematicians past and present. Aims for essential learning in school mathematics are for students to:

- demonstrate useful mathematical and numeracy skills for successful general employment and functioning in society
- solve practical problems with mathematics, especially industry and work-based problems
- develop specialist knowledge in mathematics that provides for further study in the discipline
- see mathematical connections and be able to apply mathematical concepts, skills and processes in posing and solving mathematical problems
- be confident in one's personal knowledge of mathematics, to feel able both to apply it, and to acquire new knowledge and skills when needed
- be empowered through knowledge of mathematics as a numerate citizen, able to apply this knowledge critically in societal and political contexts
- develop understanding of the role of mathematics in life, society and work; the role of mathematics in history; and mathematics as a discipline – its big ideas, history, aesthetics and philosophy.

Mathematical knowledge includes knowledge of concepts, objects, definitions and structures. A small collection of mathematical ideas, objects, structures, and relationships between these, is taken as undefined and *given* in a context. New mathematical objects, structures and relationships are developed from these moving from simple to more complex and sophisticated ideas and practices. The motivation for accepting certain things as given building blocks for mathematical knowledge may be initially related to intuitive understanding of particular ideas and objects experienced with respect to the natural or human worlds. These and their subsequent developments are not empirical knowledge, but abstract mathematical entities.

Whether mathematical knowledge is viewed as being essentially mind dependent or mind independent, discovered or constructed, its abstract nature gives rise to the applicability of mathematics in a wide range of contexts, as mathematical objects, structures and relationships do not depend on a particular context for their existence, but are interpreted to model key features of these contexts. This abstraction poses a challenge to the teacher and student alike, and both will need to draw on knowledge of the world and link this to mathematical knowledge and its application in various situations.

Mathematical reasoning and thinking underpins all aspects of school mathematics, including problem posing, problem solving, investigation and modelling. It encompasses the development of algorithms for computation, formulation of problems, making and testing conjectures, and the development of abstractions for further investigation.

Computation and proof are essential and complementary aspects of mathematics that enable students to develop thinking skills directed toward explaining, understanding and using mathematical concepts, structures and objects. They provide a framework for the development of mathematical skills and techniques exemplified in the use of algorithms for computation and for the development of general case arguments.

## Structure of the domain

The Mathematics domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and a set of standards organised by dimension. A glossary is included which provides definitions of or additional information about underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

Definitions of underlined terms are provided in the Glossary (page 95)

## Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Mathematics, standards for assessing and reporting on student achievement apply from Level 1. Standards for *Structure* are introduced from Level 3.

## Dimensions

Standards in the Mathematics domain are organised in five dimensions:

- Number
- Space
- Measurement, chance and data
- Working mathematically
- Structure.

### Number

The *Number* dimension focuses on developing students' understanding of counting, magnitude and order. The natural (counting) numbers with zero extend to positive and negative signed whole numbers (integers) and through part-whole relations and proportions of whole numbers to the rational numbers (fractions and finite decimals or infinite recurring decimals).

Proportions of lengths involving sides and/or diagonals of right-angled triangles and rectangles and arcs of a circle lead to the introduction of certain irrational real numbers such as the square root of 2, the golden ratio  $\phi$  and fractions or multiples of  $\pi$ .

Principal operations for computation with number include various algorithms for addition (aggregation), subtraction (disaggregation) and the related operations of multiplication, division and exponentiation carried out mentally, by hand using written algorithms, and using calculators, spreadsheets or other numeric processors for calculation.

### Space

The *Space* dimension focuses on developing students' understanding of shape and location. These are connected through forms of representation of two- and three-dimensional objects and the ways in which the shapes of these objects and their ideal representations can be moved or combined through transformations. Students learn about key spatial concepts including continuity, edge, surface, region, boundary, connectedness, symmetry, invariance, congruence and similarity.

Definitions of underlined terms are provided in the Glossary (page 95)

Principal operations for computation with space include identification and representation, construction and transformation by hand using drawing instruments, and also by using dynamic geometry technology.

### Measurement, chance and data

The *Measurement, chance and data* dimension focuses on developing students' understanding of unit, measure and error, chance and likelihood and inference. Measure is based on the notion of unit (*informal*, *formal* and *standard*) and relates number and natural language to measuring characteristics or attributes of objects and/or events. Various technologies are used to measure, and all measurement involves error.

Students learn important common measures relating to money, length, mass, time and temperature, and probability – the measure of the chance or likelihood of an event. Other measures include area, volume and capacity, weight, angle, and derived rates such as density, concentration and speed.

Principal operations for computation with measurement include the use of formulas for evaluating measures, the use of technology such as dataloggers for direct and indirect measurement and related technologies for the subsequent analysis of data, and estimation of measures using comparison with prior knowledge and experience, and spatial and numerical manipulations.

### Structure

The *Structure* dimension focuses on developing students' understanding of set, logic, function and algebra. It is fundamental to the concise and precise nature of mathematics and the generality of its results. Key elements of mathematical structure found in each of the dimensions of Mathematics are membership, operation, closure, identity, inverse, and the commutative, associative and distributive properties as well as other notions such as recursion and periodic behaviour.

While each of these can be considered in its own right, it is in their natural combination as applied to elements of number, space, function, algebra and logic with their characteristic operations that they give rise to the mathematical systems and structures that are embodied in each of these dimensions.

Principal operations for computation with structure include mental, by hand and technology-assisted calculation and symbolic manipulation by calculators, spreadsheets or computer algebra systems, with sets, logic, functions and algebra.

### Working mathematically

*Working mathematically* focuses on developing students' sense of mathematical inquiry: problem posing and problem solving, modelling and investigation. It involves students in the application of principled reasoning in mathematics, in natural and symbolic language, through the mathematical processes of conjecture, formulation, solution and communication; and also engages them in the aesthetic aspects of mathematics.

In this dimension the nature, purpose and scope of individual work is connected to that of the broader mathematical community, and the historical heritage of mathematics through the discourse of working mathematically. Mental, by hand and technology-assisted methods provide complementary approaches to working mathematically.

## Relationships between the dimensions

*Number* is related to the other dimensions through the aspects of counting, magnitude and order. It has logical and natural connections with *Measurement*, *chance and data*, and *Space*. Number systems provide the basis for the development of algebraic relationships in *Structure* and the contexts and explorations used in *Working mathematically*.

*Space* is related to the *Number* and *Measurement, chance and data* dimensions through the aspects of shape and location. The properties of patterns, transformations, and symmetry provide links to *Structure* and *Working mathematically*.

*Measurement, chance and data* is related to the *Number* and *Space* dimensions through the aspects of units, error, approximation, likelihood, angle, and the properties of two- and three-dimensional shapes. The application of measurement formulas and functions provide a link to *Structure*. A varied collection of practical contexts for generating and testing conjectures provides links to *Working mathematically*.

*Structure* is related to the *Number, Space* and *Measurement, chance and data* dimensions through the use of algorithms, patterns and functions. It is linked to *Working mathematically* through the key elements of mathematical language, concepts and relationships used in modelling and investigations.

*Working mathematically* is related to the *Number, Space* and *Measurement, chance and data* dimensions through the exploration of algorithms, patterns and functions, shapes and dimensions. It provides the processes for the development of inferences and deductions and for the exploration and proof of conjectures related to the *Structure* dimension.

Definitions of underlined terms are provided in the Glossary (page 95)

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

The Statements of Learning were developed as a means of achieving greater national consistency in curriculum outcomes across the eight Australian states and territories. It was proposed that they be used by state and territory departments or curriculum authorities (their primary audience) to guide the future development of relevant curriculum documents. They were agreed to by all states and territories in August 2006.

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## National Numeracy Benchmarks

National Numeracy Benchmarks are used for reporting achievement in three aspects of numeracy – ‘Number sense’, ‘Spatial sense’ and ‘Measurement and data sense’ – at Years 3, 5 and 7. The benchmarks define nationally agreed minimum acceptable standards for numeracy at these years.

Full details of the National Numeracy Benchmarks are available in *Numeracy Benchmarks Years 3, 5 and 7*, Curriculum Corporation, 2000 at <[www.curriculum.edu.au/projects/numbench.php](http://www.curriculum.edu.au/projects/numbench.php)>.

The benchmarks describe minimum standards. For this reason, the Year 3 benchmarks relate to Level 2 Mathematics standards, the Year 5 benchmarks relate to Level 3 Mathematics standards and the Year 7 benchmarks relate to Level 4 Mathematics standards. Links to the numeracy benchmarks are located in the Mathematics standards.

# Level 3

## Learning focus

As students work towards the achievement of Level 3 standards in Mathematics, they recognise and explore patterns in numbers and shapes. They increasingly use mathematical terms and symbols to describe computations, measurements and characteristics of objects.

In *Number*, students use structured materials to explore place value and order of numbers to tens of thousands. They skip count to create number patterns. They use materials to develop concepts of decimals to hundredths. They use suitable fraction material to develop concepts of equivalent fractions and to compare fraction sizes. They apply number skills to everyday contexts such as shopping. They extend addition and subtraction computations to three digit numbers. They learn to multiply and divide by single digit numbers.

In *Space*, students sort lines, shapes and solids according to key features. They use nets to create three-dimensional shapes and explore them by counting edges, faces and vertices. They visualise and draw simple solids as they appear from different positions. They investigate simple transformations (reflections, slides and turns) to create tessellations and designs. They explore the concept of angle as turn (for example, using clock hands) and as parts of shapes and objects (for example, at the vertices of polygons). They use grid references (for example, A5 on a street directory) to specify location and compass bearings to describe directions. They use local and larger-scale maps to locate places and describe suitable routes between them.

In *Measurement, chance and data*, students measure the attributes of everyday objects and events using formal (for example, metres and centimetres) and informal units (for example, pencil lengths). Students tell the time using analogue and digital clocks and relate familiar activities to the calendar. Students investigate natural variability in chance events and order them from least likely to most likely. Students conduct experiments and collect data to construct simple frequency graphs. They use simple two-way tables (karnaugh maps) to sort non-numerical data.

In *Structure*, students use structured material (in tens, hundreds and thousands) to develop ideas about multiplication by replication and division by sharing. They recognise the possibility of remainders when dividing. They learn to use number properties to support computations (for example, they use the commutative and associative properties for adding or multiplying three numbers in any order or combination). They investigate the distributive property to develop methods of multiplication and division by single digit whole numbers. They learn to use and describe simple algorithms for computations. They use simple rules to generate number patterns (for example, 'the next term in the sequence is two more than the previous term').

Definitions of underlined terms are provided in the Glossary (page 95)



They create and complete number sentences using whole numbers, decimals and fractions.

When *Working mathematically*, students use mathematical symbols (for example, brackets, division and inequality, the words and, or and not). Students develop and test ideas (conjectures) across the content of mathematical experience. For example:

- in *Number*, the size and type of numbers resulting from computations
- in *Space*, the effects of transformations of shapes
- in *Measurement, chance and data*, the outcomes of random experiments and inferences from collected samples.

Students learn to recognise practical applications of mathematics in daily life, including shopping, travel and time of day. They identify the mathematical nature of problems for investigation. They choose and use learned facts, procedures and strategies to find solutions. They use a range of tools for mathematical work, including calculators, computer drawing packages and measuring tools.

### National Statements of Learning

This learning focus statement, with the following elaboration, incorporates the Year 3 National Statement of Learning for Mathematics.

#### Elaboration:

They recognise angles ... as parts of shapes and objects ...

## Standards

### Number

At Level 3, students use place value (as the idea that 'ten of these is one of those') to determine the size and order of whole numbers to tens of thousands, and decimals to hundredths. They round numbers up and down to the nearest unit, ten, hundred, or thousand. They develop fraction notation and compare simple common fractions such as  $\frac{3}{4} > \frac{2}{3}$  using physical models. They skip count forwards and backwards, from various starting points using multiples of 2, 3, 4, 5, 10 and 100.

They estimate the results of computations and recognise whether these are likely to be over-estimates or under-estimates. They compute with numbers up to 30 using all four operations. They provide automatic recall of multiplication facts up to  $10 \times 10$ .

They devise and use written methods for:

- whole number problems of addition and subtraction involving numbers up to 999

Definitions of underlined terms are provided in the Glossary (page 95)

- multiplication by single digits (using recall of multiplication tables) and multiples and powers of ten (for example,  $5 \times 100$ ,  $5 \times 70$ )
- division by a single-digit divisor (based on inverse relations in multiplication tables).

They devise and use algorithms for the addition and subtraction of numbers to two decimal places, including situations involving money. They add and subtract simple common fractions with the assistance of physical models.

### Space

At Level 3, students recognise and describe the directions of lines as vertical, horizontal or diagonal. They recognise angles are the result of rotation of lines with a common end-point. They recognise and describe polygons. They recognise and name common three dimensional shapes such as spheres, prisms and pyramids. They identify edges, vertices and faces. They use two-dimensional nets, cross-sections and simple projections to represent simple three-dimensional shapes. They follow instructions to produce simple tessellations (for example, with triangles, rectangles, hexagons) and puzzles such as tangrams. They locate and identify places on maps and diagrams. They give travel directions and describe positions using simple compass directions (for example, N for North) and grid references on a street directory.

### Measurement, chance and data

At Level 3, students estimate and measure length, area, volume, capacity, mass and time using appropriate instruments. They recognise and use different units of measurement including informal (for example, paces), formal (for example, centimetres) and standard metric measures (for example, metre) in appropriate contexts. They read linear scales (for example, tape measures) and circular scales (for example, bathroom scales) in measurement contexts. They read digital time displays and analogue clock times at five-minute intervals. They interpret timetables and calendars in relation to familiar events. They compare the likelihood of everyday events (for example, the chances of rain and snow). They describe the fairness of events in qualitative terms. They plan and conduct chance experiments (for example, using colours on a spinner) and display the results of these experiments. They recognise different types of data: non-numerical (categories), separate numbers (discrete), or points on an unbroken number line (continuous). They use a column or bar graph to display the results of an experiment (for example, the frequencies of possible categories).

### Structure

At Level 3, students recognise that the sharing of a collection into equal-sized parts (division) frequently leaves a remainder. They investigate sequences of decimal numbers generated using multiplication or division by 10. They understand the meaning of the '=' in mathematical statements and technology displays (for example, to indicate either the result of a computation or equivalence). They use number properties in combination to facilitate computations (for example,  $7 + 10 + 13 = 10 + 7 + 13 = 10 + 20$ ).

They multiply using the distributive property of multiplication over addition (for example,  $13 \times 5 = (10 + 3) \times 5 = 10 \times 5 + 3 \times 5$ ). They list all possible outcomes of a simple chance event. They use lists, Venn diagrams and grids to show the possible combinations of two attributes. They recognise samples as subsets of the population under consideration (for example, pets owned by class members as a subset of pets owned by all children). They construct number sentences with missing numbers and solve them.

### Working mathematically

At Level 3, students apply number skills to everyday contexts such as shopping, with appropriate rounding to the nearest five cents. They recognise the mathematical structure of problems and use appropriate strategies (for example, recognition of sameness, difference and repetition) to find solutions.

Students test the truth of mathematical statements and generalisations. For example, in:

- number (which shapes can be easily used to show fractions)
- computations (whether products will be odd or even, the patterns of remainders from division)
- number patterns (the patterns of ones digits of multiples, terminating or repeating decimals resulting from division)
- shape properties (which shapes have symmetry, which solids can be stacked)
- transformations (the effects of slides, reflections and turns on a shape)
- measurement (the relationship between size and capacity of a container).

Students use calculators to explore number patterns and check the accuracy of estimations. They use a variety of computer software to create diagrams, shapes, tessellations and to organise and present data.

## Year 5 National Numeracy Benchmarks

The benchmarks describe minimum standards. For this reason, the Year 5 benchmarks relate to Level 3 Mathematics standards. Numeracy benchmarks are located at Curriculum Corporation <[www.curriculum.edu.au/projects/numbench.php](http://www.curriculum.edu.au/projects/numbench.php)>.

# Science

## Introduction

To be human is to be curious about the world we live in, to wonder why it is that way, and to ask about our place in it. A fundamental goal for science education is to stimulate, respond to and nourish such curiosity, wonder and questioning. Science provides us with one view of the world – a view that changes as our knowledge and understanding of science evolves.

Science is a human process, influenced by and influencing social values. Science has a long and fascinating history of human attempts to appreciate, understand, control and manage our world. Scientists use techniques of scientific investigation to create an understanding of the world. The resulting cumulative knowledge is part of our human heritage.

Science is dynamic and progressive. Our society is being continually confronted, challenged and redirected by ideas borne from people's curiosity, imagination and dreams about what might be possible. The work of scientists such as Newton, Einstein, Curie, Darwin, Florey, Macfarlane Burnet and Oliphant began as 'why' and 'what if'. Their work challenged and subsequently changed accepted opinions in the areas of motion and gravity, radioactivity, evolution, medicine, immunology, structure of the nucleus of the atom, and nuclear energy. This and other accepted science knowledge continues to fuel the dreams of a new generation of scientists as they explore the expanding frontiers of science.

Science has had, and will continue to have, successes and setbacks as technologies that provide people with an improved quality of life are developed and implemented.

It is becoming increasingly important that students understand these challenges and redirections, and the implications of these for their own life choices, the environment and the community (local and global) in which they live. Building students' science capability is critical to help them develop the skills and understanding necessary to meet these challenges and make responsible, informed choices.

Science extends our understanding beyond what affects us to include what we can't see, feel, hear or touch but can only imagine. Science capability is multidimensional, consisting of dispositional facets (interest and curiosity), operational facets (creativity and problem solving) and cognitive facets (reasoning and critical thinking). The extent to which we as citizens understand and appreciate these interactions will shape our future.

A set of values inform and govern how scientists operate including respect for the environment (living and non-living) and the opinions and ideas of others, honesty in collecting and presenting data and evidence, and acknowledgment

of the work of others. These values are an integral part of a science curriculum that explores and encourages debate about the relationship between science, society and technology.

A major goal of science education is to develop citizens who are capable of engaging in informed debate about science and its applications. Increasing emphasis will be placed on the role of science and the work of Australian and other scientists in addressing issues of sustainability at a local and global level. Science education provides opportunities for students to develop the skills and understanding appropriate to service and good citizenship. It also encourages students to articulate science values and accept the ethical principles embedded in science research. While only some students directly pursue a career in science and scientific research, all students need to appreciate the significance of science for the long-term future of our society.

## Structure of the domain

The Science domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 3, a set of standards organised by dimension. A glossary is included which provides definitions of or additional information about underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Science, standards for assessing and reporting on student achievement apply from Level 3.

### Dimensions

Standards in the Science domain are organised in two dimensions:

- Science knowledge and understanding
- Science at work.

These two dimensions include the traditional science disciplines of biology, chemistry, earth science, environmental science, health sciences, neuroscience, physics and space sciences and the emerging sciences including biotechnology, green chemistry, nanotechnology, and synchrotron science.

Definitions of underlined terms are provided in the Glossary (page 95)

The dimensions build students' understanding of how science knowledge in the disciplines has been constructed through time and is applied in practical contexts.

The development of *Science knowledge and understanding* necessarily involves conceptual and experiential understanding of *Science at work*, and understanding of the ways the concepts, theories and models of science are used throughout the society in which students live.

*Science at work* involves students learning the processes of science through the ways they undertake and reflect on their own investigations and those of others.

The two dimensions are interrelated in the ways science affects the broader society in which the students live. Students' own experience of science assists them to develop an understanding of these interactions. The two dimensions are also interrelated in ways that are central to both pedagogy and content.

### Science knowledge and understanding

The *Science knowledge and understanding* dimension focuses on building student understanding of the overarching conceptual ideas of science. These include understanding:

- the nature of the similarities between, and the diversity of, living things and their sustainable relationships with each other and their environment
- concepts related to matter – its properties and uses, and the production of different substances through chemical change
- concepts of energy and force as a way of explaining physical phenomena
- the place of the Earth in time and space and the interactions between the Earth and its atmosphere
- how scale is important in relating structure to function at microscopic and macroscopic levels.

These understandings enable students to build on their curiosity and answer their own questions about themselves and their interactions with the world while at the same time allowing them to think through contemporary challenges and issues. Through this, students come to understand how science relates to society and the environment.

### Science at work

The *Science at work* dimension focuses on students experiencing and researching how people work with and through science. Students learn to be curious and to use scientific understanding and processes to find answers to their questions. They design and pursue investigations ethically and safely; generate, validate and critique evidence; analyse and interpret ideas and link

Definitions of underlined terms are provided in the Glossary (page 95)

them with existing understanding; work and reason with scientific models and communicate their findings and ideas to others. They identify and practise the underlying values, skills and attributes of science.

Through their investigations, they gain insight into science as a human activity and the relationship between science, technology and society both now and in the future. They explore how science is used in multiple contexts throughout their lives and its pervasiveness throughout the workplace.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

The Statements of Learning were developed as a means of achieving greater national consistency in curriculum outcomes across the eight Australian states and territories. It was proposed that they be used by state and territory departments or curriculum authorities (their primary audience) to guide the future development of relevant curriculum documents. They were agreed to by all states and territories in August 2006.

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

### Safety

Students will be exposed to potentially hazardous materials and practices when undertaking scientific activities and investigations. Beginning with their first year at school, students are made aware of safe practices and are encouraged to act responsibly when conducting investigations. As students progress through their schooling they develop skills in the safe use of scientific apparatus, including heating and electrical equipment, the safe handling of living and non-living organic materials and the correct use and disposal of chemicals.

Standards and practices should be consistent with legal requirements including Occupational Health and Safety (OH&S). Material Safety Data Sheets (MSDS) provide information about the safe handling of hazardous substances used

Definitions of underlined terms are provided in the Glossary (page 95)

at the workplace. A Scientific Procedures Premises License (SPPL) is required when animals are used to teach science. If keeping animals then the *Prevention of Cruelty to Animals Act 1986* and the *National Statement on Ethical Conduct in Research Involving Humans* – National Health and Medical Research Council (NHMRC) 2001 also apply.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Science, they begin to design and conduct experiments to explore contexts drawn from traditional and emerging sciences. They investigate questions and ideas about the natural world and learn to use scientific vocabulary in place of everyday language to describe and explain their observations and measurements. They begin to understand that the design of experiments is directly related to their questions about things and events. They learn to describe evidence in support of simple scientific ideas.

Students investigate changes they observe; for example, day becoming night, using brakes to stop a bicycle hitting a gate, seed germination and plant growth, and the regeneration of forests after a bushfire. They examine, by referring to energy transformation, the operation of a range of everyday devices; for example, gates, locks, toasters and hot water systems. They investigate the use of solar energy in cooking or lighting or transport. Students learn about the actions of forces on objects that affect their motion and shape in everyday situations such as walking, playing ball games, blowing up balloons, playing with moving toys and riding in cars or aeroplanes. They explore the relationship between distance and the apparent size of an observed object. They participate in activities where they learn to classify a variety of materials using states of matter (solids, liquids, gases) and they learn that some materials are difficult to classify; for example, honey, plaster, jelly and carbonated soft drinks. They explore reversible and non-reversible changes to common substances such as water, vinegar and bicarbonate of soda.

They begin to understand how different parts work together in plants and animals to produce change and to aid in survival; for example, growth and movement. They realise that offspring are similar to their parents. They learn to classify things that they find in their environment as living (biotic) or non-living (abiotic). They investigate how humans affect the survival of living things and change the environment, and how interactions between living things in the environment change. They investigate natural processes that change the environment over short periods of time (tsunami, drought, floods) and long periods of time (weathering and erosion). Students are introduced to the

Definitions of underlined terms are provided in the Glossary (page 95)



concept of a sustainable environment and their role in contributing to it; for example, involvement in local litter programs and recycling at home and at school.

Students relate scientific ideas to their own experiences, interests and concerns, and to a variety of personal and community uses of science and links with technology; for example, the location of mobile phone towers or clearing local bushland to build new roads. They examine how scientists work and how science knowledge has developed by visiting scientists at work, listening to guest speakers or conducting research on the Internet. Students discuss safety considerations and a variety of procedures and processes (including fair tests, variables, ethical considerations relating to observing animals, and selecting and using equipment correctly) that could be used when undertaking experiments.

### National Statements of Learning

This learning focus statement, with the following elaborations, incorporates the Year 3 National Statement of Learning for Science. It also incorporates aspects of the Year 5 National Statement of Learning for Science.

#### Elaborations:

- Students investigate changes they observe; for example, day becoming night, using brakes to stop a bicycle hitting a gate, seed germination and plant growth, and the regeneration of forests after a bushfire.
- Students learn about the actions of forces on objects that affect their motion and shape in everyday situations such as walking, playing ball games, blowing up balloons, playing with moving toys and riding in cars or aeroplanes.
- They explore the relationship between distance and the apparent size of an observed object.
- They realise that offspring are similar to their parents.

## Standards

### Science knowledge and understanding

At Level 3, students classify a range of materials such as solids, liquids and gases according to observable properties, and demonstrate understanding that this system of classification of substances is sometimes problematic. Students describe examples of reversible and non-reversible changes in substances.

Students identify the actions of forces in everyday situations. They use the words *push* and *pull* in discussing how things can be moved and stopped. They identify forms of energy and energy transformations in the everyday world. They use appropriate scientific vocabulary to describe and explain their observations and investigations.

Students identify and describe the structural features of living things, including plants and animals. They identify how these features operate together to form systems which support living things to survive in their environments. They distinguish between biotic and abiotic factors in their environment and describe interactions that occur between them. They describe natural physical and biological conditions, and human influences in the environment, which affect the survival of living things. They describe the relationship between day and night and the rotation of the Earth. Students explain how features of the landscape are altered by processes of weathering and erosion.

### Science at work

At Level 3, students plan, design, conduct and report collaboratively on experiments related to their questions about living and non-living things and events. They select and use simple measuring equipment, use a range of appropriate methods to record observations, and comment on trends. They describe the concept of a fair test and identify the variables associated with an experiment. They develop fair tests to make comparisons and explain how they have controlled experimental variables.

Students describe safety requirements and procedures associated with experiments. They explain how scientific knowledge is used, or could be used, to solve a social issue or problem. They describe aspects of the work of scientists and how this has contributed to science knowledge.

# Interdisciplinary Learning

The Interdisciplinary Learning strand identifies a range of knowledge, skills and behaviours which cross disciplinary boundaries and are essential to ensuring students are prepared as active learners and problem-solvers for success at school and beyond. This strand focuses on ways of thinking, communicating, conceiving and realising ideas and information. It assists students to develop the capacity to design, create and evaluate processes as a way of developing creativity and innovation.

Within the Interdisciplinary Learning strand the learning domains are:

## Communication

Communication helps to construct all learning and is central to the capacity to demonstrate and convey what one has learned in different contexts and to different people. This domain assists students to understand that language and discourse differ in different disciplines and that there is a need to learn the particular literacies involved in each.

## Design, Creativity and Technology

Students develop the knowledge, skills and behaviours related to investigating and designing using appropriate planning processes and design briefs; creating and developing ideas, applying information, and seeking and testing innovative alternatives; producing, including the selection and safe use of appropriate tools, equipment, materials and/or processes to meet the requirements of design briefs; analysing and evaluating both processes and products including, where relevant, any broader environmental, social, cultural and economic factors.

## Information and Communications Technology

The knowledge, skills and behaviours in this domain enable students to use information and communications technology (ICT) to access, process, manage and present information; model and control events; construct new understandings; and communicate with others. Students use ICT and strategies to monitor learning patterns, to process data to create solutions and information products that demonstrate understanding, and to share their work with others in ethical, legal and respectful ways.

## Thinking Processes

This domain encompasses a range of cognitive, affective and metacognitive knowledge, skills and behaviours which are essential for effective functioning in society both within and beyond school. The study of thinking enables students to acquire strategies for thinking related to enquiry, processing information, reasoning, problem solving, evaluation and reflection.

# Communication

## Introduction

Communication is central to the capacity to construct meaning and to convey information and understanding to others in a range of ways and in a variety of settings. Successful communication requires students to be familiar with the forms, language and conventions used in different contexts and employ them to communicate effectively.

The Communication domain focuses on developing students who communicate clearly and confidently in a range of contexts both within and beyond school. It aims to assist students to develop awareness that language and discourse differ across the curriculum and that there is a need to learn literacies involved in each subject they undertake. To communicate successfully students need to develop the knowledge, skills and behaviours that empower them to respond to, make meaning of, and deconstruct a range of communication forms. They also need to develop the knowledge, skills and behaviours to effectively present information, ideas and opinions in a range of forms, including verbal, written, graphic, multimedia and performance, appropriate to their context, purpose and audience.

## Structure of the domain

The Communication domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 4, a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Communication, standards for assessing and reporting on student achievement apply from Level 4.

### Dimensions

Standards in the Communication domain are organised in two dimensions:

- Listening, viewing and responding
- Presenting.

Definitions of underlined terms are provided in the Glossary (page 95)

### Listening, viewing and responding

Effective communication demands that students develop the ability to listen, view and respond to communication forms with respect to content and context. The *Listening, viewing and responding* dimension focuses on developing student understanding of communication conventions, strategies to assist them to make meaning of communication forms and the ability to deconstruct and respond to a diversity of forms. This involves developing familiarity with forms, language and conventions used in different contexts across the curriculum.

### Presenting

The ability to present information and learning in a coherent and appropriate manner is critical for all learners. The *Presenting* dimension involves students gaining the knowledge, skills and behaviours to understand context, purpose and audience; select and use appropriate structure and organisation to convey meaning; and reflect on the style and content of the presentations they make.

## National Statements of Learning

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# Level 3

## Learning focus

As students work towards the achievement of Level 4 standards in Communication, they listen attentively when required and learn to respond and interject appropriately. They learn about appropriate body language when reacting to a speaker and use feedback from peers and the teacher on their own body language to improve their reactions. They practise paraphrasing what a speaker has said to check meaning and ask clarifying questions where meaning is unclear.

Students explore a range of aural, written and visual communication forms such as the Internet, film, texts and music which illustrate a variety of perspectives on a range of topics and ideas. They learn how to identify the main message, develop their own interpretation, and provide evidence to support it. They explore reasons for other interpretations not being the same as theirs and learn to respect the right of others to express opinions.

During both formal and informal presentations, students explore the use of a range of verbal and non-verbal strategies, to enhance meaning and to engage their audience; for example, physical positioning in the room and use of props, costume, humour and audience participation. They begin to order logically the ideas that they wish to communicate. When developing formal presentations, students experiment with various forms; for example, a dramatic performance and use of presentation software. With guidance, they reflect on their own and others' presentations and note the features that make them effective.

### National Statements of Learning

This Learning focus statement incorporates aspects of the National Statements of Learning for Civics and Citizenship, Year 3.

## Standards

In Communication, standards for assessing and reporting on student achievement are introduced at Level 4. The learning focus statements for Levels 1 to 3 provide advice about learning experiences that will assist students to work towards the achievement of the standards at Level 4.

# Design, Creativity and Technology

## Introduction

The domain of Design, Creativity and Technology emphasises engagement in designing, creating and evaluating processes, products and technological systems using a range of materials as a way of developing creativity and innovation. Creativity in this domain can be described as applying imagination and lateral and critical thinking throughout design and development processes. Innovation is an outcome of the broad exploration of ideas, materials/ingredients, and technical processes that can occur when individuals are involved in investigating, designing, producing, analysing and evaluating their own and others' products and/or systems.

Design is a vital step in transforming ideas into creative, practical and commercial realities by optimising the value of products and systems. Designing and its application involve planning and organising production, and evaluating products in a real context. Contexts may relate to; for example, what we grow, eat, wear, build, make, our health and safety, and how we travel and spend our leisure time. Designers consider problems, needs, wants and opportunities and respond to them by developing a range of ideas, which are developed into utilitarian products or systems.

Development of capability in this domain includes the ability to use, manage, assess and understand design, creativity, technology, and their relationship to innovation. In more detail, this involves students:

- posing problems and actively identifying needs, wants, opportunities and areas for improvement
- gathering information and building knowledge about the nature of needs, wants, opportunities and areas for improvement and the best routes to take towards designing a solution
- developing and using design and technology skills, knowledge and processes, including proposing, experimenting, learning from results and synthesising, to create new and/or improved products and/or systems
- using tools, equipment, materials/ingredients and systems components safely and creatively to make quality products and/or systems
- understanding that design, creativity and technology leads to innovation
- assessing the outcomes of design and technology processes, and the resulting products and technological systems in relation to environmental, social and economic factors.

Definitions of underlined terms are provided in the Glossary (page 95)

This domain involves experiential, practical and applied knowledge as well as theoretical understanding. It requires students to be autonomous and creative problem-solvers, as individuals and as members of a team. Students combine an understanding of design, functionality, aesthetics, social, cultural, economic and environmental issues, and industrial practices with practical skills. As they do so, they reflect on and evaluate past and present design and technology, its uses and effects.

The Design, Creativity and Technology domain focuses on development of students' skills in managing and manipulating materials and resources using a range of tools, equipment and machines to make functional physical products or systems. These materials include food, wood, metal, timber, plastics, textiles, ceramics, plants and soil/growing media and components such as wheels and axles, pulleys and belts, gears, switches, lights, motors, connecting wires, batteries and printed circuits boards.

## Structure of the domain

The Design, Creativity and Technology domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 3, a set of standards organised by dimension. A glossary is included which provides definitions of underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Design, Creativity and Technology, standards for assessing and reporting on student achievement apply from Level 3.

### Dimensions

Standards in the Design, Creativity and Technology domain are organised in three dimensions:

- Investigating and designing
- Producing
- Analysing and evaluating.

Definitions of underlined terms are provided in the Glossary (page 95)



Activities associated with the three dimensions are linked and may be applied sequentially, where students move directly from investigating to designing, producing and evaluating. Or alternatively, students may move between the dimensions as they solve a problem. For example, to assist their decision making while designing a product or system, students may evaluate the potential impact on the environment of the intended use of materials/ ingredients, components or processes required to make the product or system. Additionally, after evaluating a product they have made, students may return to the *Investigating and designing* and *Producing* dimensions to improve the product. In this way, students may work in a non-sequential manner through the dimensions in this domain. In order for students to demonstrate knowledge, skills and behaviours in this domain a 'design and make' project-based learning approach must be taken, that focuses on meeting the problem, need/s or requirements defined in a design brief.

### **Investigating and designing**

In the *Investigating and designing* dimension, students identify ideas, problems, needs, wants and opportunities. A design brief can be a starting point or it can be developed to clearly define the idea, problem, need, want or opportunity and requirements for a solution. Students undertake research and investigation to identify the human, material, equipment, and/or energy resources available to meet the idea, problem, need, want or opportunity.

Students combine practical and design skills with knowledge, skills and behaviours from other domains to select and record creative methods of generating and depicting design possibilities and options. They devise a plan to outline the processes involved in making a product, and select and justify the option that best meets the requirements of the design brief.

### **Producing**

The *Producing* dimension involves students in the management of the production phase and includes the appropriate selection and safe manipulation and use of tools, equipment, materials/ingredients and components to carry out processes appropriate to the materials/ingredients or assembly of systems components to produce a quality product or technological system.

Students explore, share and use both traditional and more innovative techniques. They reflect upon their progress and alter plans as appropriate. Progress and changes to plans are reflected upon and altered as appropriate.

### **Analysing and evaluating**

In the *Analysing and evaluating* dimension, students compare the outcomes of design and production activities with earlier design work and planned intentions. Following the application of testing, improvements, modifications and alternative approaches are considered.

This dimension also involves students in describing, analysing and evaluating the impact and value of both their own and others' technological products, technological systems, processes and innovations (past, present and predicted future) on the individual, society and culture, the environment and the economy. This includes consideration of sustainability issues.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

The Statements of Learning were developed as a means of achieving greater national consistency in curriculum outcomes across the eight Australian states and territories. It was proposed that they be used by state and territory departments or curriculum authorities (their primary audience) to guide the future development of relevant curriculum documents. They were agreed to by all states and territories in August 2006.

During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Design, Creativity and Technology, they begin to provide input into the development of design briefs. They generate ideas from a variety of sources, and recognise that their designs have to meet a range of different requirements. They learn to make realistic plans for achieving their aims and recognise that they are constrained by the availability of resources. They clarify ideas when asked, and use words, labelled sketches and models to communicate the details of their designs.

Students learn to describe ideas and concepts about design, materials/ingredients and technological systems in simple terms. For example, how

Definitions of underlined terms are provided in the Glossary (page 95)

and why a drawing is annotated; how materials/ingredients are classified; the systems components that are combined to create movement, such as gears and pulleys; what characteristics and properties make materials/ingredients suitable for a particular design or proposed product and how these can be combined in innovative ways to create solutions. In transforming novel ideas into products or simple systems, they are encouraged to take risks.

Students investigate what products and simple technological systems can do, how they meet people's needs, how they are used and/or work, what they look like and why they look the way they do. They learn what evaluation criteria are and, with guidance, develop simple evaluation criteria and use these to make decisions about, and assess, design ideas. With assistance, they learn to plan basic steps in production. They develop skills in the use of a variety of simple production techniques, such as cutting, mixing, shaping, joining and assembling and a range of materials/ingredients to produce products, such as a healthy breakfast cereal and its packaging and simple systems; for example, a puppet with moving parts (levers) or a pulley arrangement to lift a weight. Production techniques could include cutting with a saw or knife, weighing with scales, measuring with a jug, filing with a file or rasp, sandpapering, whisking and hand sewing with a needle and thread. Materials could include paper and cardboard, food ingredients, fabrics, wood, plants and soil or other growing media. They learn to use tools and equipment safely and hygienically, and with some accuracy, to alter and combine materials/ingredients and put together components to make a simple system with moving parts.

Students are encouraged to give and receive feedback about their own and others' products and simple systems (for example, a toy with moving parts), considering whether design solutions work and if they are appropriate for their purpose. They learn to keep simple records and reflect on the steps they took to design and make their own products and simple systems, including noting any problems encountered and changes made to accommodate these.

## Standards

### Investigating and designing

At Level 3 students, individually and in teams, generate ideas based on a design brief, demonstrating understanding that designs may need to meet a range of different requirements. They use words, labelled sketches and models to communicate the details of their designs, and clarify ideas when asked. They identify simple systems components and common materials/ingredients and explain the characteristics and properties that make them suitable for use in products. Students think ahead about the order of their work and list basic steps to make the product or system they have designed.

Definitions of underlined terms are provided in the Glossary (page 95)

**Producing**

At Level 3, students use their list of steps and are able to choose appropriate tools, equipment and techniques to alter and combine materials/ingredients and assemble systems components. They use a variety of simple techniques/processes and a range of materials/ingredients to safely and hygienically alter and combine materials/ingredients and put together components to make products and simple systems that have moving parts.

**Analysing and evaluating**

At Level 3, students test, evaluate and revise their designs, products or simple systems in light of feedback they have gained from others. They identify what has led to improvements and describe what they consider to be the strengths and drawbacks of their design, product or simple system. They consider how well a product or simple system functions and/or how well it meets the intended purpose.

# Information and Communications Technology

## Introduction

Information and communications technology (ICT) is the hardware and software that enables data to be digitally processed, stored and communicated. ICT can be used to access, process, manage and present information; model and control events; construct new understanding; and communicate with others.

Information and Communications Technology, as an interdisciplinary domain, focuses on providing students with the tools to transform their learning and to enrich their learning environment. The knowledge, skills and behaviours identified for this domain enable students to:

- develop new thinking and learning skills that produce creative and innovative insights
- develop more productive ways of working and solving problems individually and collaboratively
- create information products that demonstrate their understanding of concepts, issues, relationships and processes
- express themselves in contemporary and socially relevant ways
- communicate locally and globally to solve problems and to share knowledge
- understand the implications of the use of ICT and their social and ethical responsibilities as users of ICT.

Learning in this domain enables students to focus on the task to be accomplished rather than on the technology they are using to do the work. Through the selection and application of appropriate equipment, techniques and procedures, they process data and information skilfully to create information products in forms that are meaningful for themselves and their audience. These products effectively demonstrate their knowledge and understanding of the concepts, issues, relationships and processes that are the subject of the task.

Students are provided with tools and strategies to monitor learning patterns and problem solving strategies. This provides a sound foundation for transforming personal learning. They gain an understanding of Internet protocols and strategies for exchanging information, which enables them to share and challenge their own and other people's ideas and solutions with a global audience.

Definitions of underlined terms are provided in the Glossary (page 95)

## Structure of the domain

The Information and Communications Technology domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, where applicable, a set of standards organised by dimension. A glossary is included which provides definitions of underlined terms (see page 95).

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Information and Communications Technology, standards for assessing and reporting on student achievement apply from Level 2. Standards are organised by dimensions from Level 3.

### Dimensions

Standards in the Information and Communications Technology domain are organised in three dimensions:

- ICT for visualising thinking
- ICT for creating
- ICT for communicating.

#### ICT for visualising thinking

In the *ICT for visualising thinking* dimension students use ICT tools to assist their thinking processes and reflect on the thinking strategies they use to develop understanding.

ICT provides a rich and flexible learner-centred environment in which students can experiment and take risks when developing new understanding. Its extensive capabilities allow students, by visually coding and representing their thinking, to clarify thoughts, and to identify patterns and form relationships between new and existing knowledge.

ICT tools that facilitate visual thinking are ones that allow ideas and information in all areas of the curriculum to be easily and quickly drafted, filtered, reorganised, refined and systematically assessed in order to make meaning for students.

Definitions of underlined terms are provided in the Glossary (page 95)

Students use linguistic and non-linguistic representations, such as graphic organisers, ICT-generated simulations and models and ICT-controlled models to help structure their thinking processes and assist in constructing knowledge.

Using ICT, students record their decisions and actions when solving problems and clarifying thoughts. They monitor the changes in their thinking and evaluate their own and others' thinking strategies. Students review these records to assess their suitability for new situations.

### ICT for creating

The *ICT for creating* dimension focuses on students using ICT tools for creating solutions to problems and for creating information products. Through the selection and application of appropriate equipment, techniques and procedures, students learn to:

- process data and information to create solutions to problems and information products that demonstrate their knowledge and understandings of the concepts, issues, relationships and processes related to all areas of the curriculum
- manage their files to secure their contents and enable efficient retrieval
- plan and monitor the progress of extended tasks.

Students learn to use ICT efficiently to capture, validate and manipulate data for required purposes. In order to improve the appearance and functionality of information products and solutions, they apply commonly accepted conventions. They examine the ethical and legal implications of using ICT in a range of settings such as the home, school and the workplace. Students evaluate the usefulness of ICT for solving different types of problems and reflect on the effectiveness of their own use of ICT.

### ICT for communicating

The *ICT for communicating* dimension focuses on students using ICT to:

- present ideas and understandings to audiences
- communicate with known and unknown audiences
- support knowledge-building among teams.

Students use ICT to support oral presentations to live local audiences and to present ideas and understandings to unknown, remote audiences. They use ICT to communicate with others, both known and unknown, with the purpose of seeking and discussing alternative views, acquiring expert opinions, sharing knowledge and expressing ideas. Students also locate information from a range of online and multimedia resources to support their own learning.

ICT supports knowledge-building among teams and enables team members to collaborate, enquire, interact and integrate prior knowledge with new understanding.

Protocols for receiving, transferring and publishing ideas and information are needed to promote communication that respects intended audiences.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

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During 2007, the VCAA prepared a detailed map to show how the Statements of Learning are addressed and incorporated in the VELS. In the majority of cases, the VELS learning focus statements incorporate the Statements of Learning. Some Statements of Learning are covered in more than one domain. In some cases, VELS learning focus statements have been elaborated to address elements of the Statements of Learning not previously specified. These elaborations are noted at the end of each learning focus statement.

## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Information and Communications Technology (ICT), they develop skills in using ICT for problem solving, expressing ideas, and presenting information to different audiences. Working in all areas of the curriculum, students explore a range of ICT tools (for example, basic editing tools such as word processing) and simple techniques for visualising thinking. They also use simple graphic organisers such as concept maps and sequence charts to provide a framework for visualising thinking. In particular they use tools that assist in sequencing, and in identifying relationships between, ideas, facts and concepts. Students save their visualising thinking files to folders and when new but similar learning

Definitions of underlined terms are provided in the Glossary (page 95)



situations arise, they retrieve them and use them as a starting point for these situations. Students reflect on the usefulness of such tools and strategies in new circumstances.

Students compare the purposes and structures of information presented in different media, such as print, on-screen, or as an action; for example, a moving robot. Individually, students learn to process data in the form of text, images and sound to create planned information products, such as invitations, short stories, presentation files (for example, a Microsoft PowerPoint file), animations and title pages for books. Students begin to use manual (for example, proofreading) and electronic (for example, spellchecker) techniques to identify typographical errors and make appropriate corrections. They use criteria, such as the accuracy and attractiveness of their information products, to make judgments about how well they meet their purposes. Students use software tools to assist with problem solving. For example, students create a questionnaire using word-processing software to collect data about the ages and ethnicity of residents in their local area as part of their Humanities study. Their understanding of this data is then demonstrated in a presentation file. Students work collaboratively to develop their ICT skills.

When using ICT to assist with problem solving and for producing information products, students investigate and apply some practices that are ergonomically sound, such as adjusting the height of chairs to ensure that elbows are at an appropriate angle and using keying techniques that minimise wrist harm and maximise the efficiency of data entry.

Students begin to manage their files using simple ways of organising them for easy retrieval; for example, creating folders based on topics or forms such as stories, images, and projects. They compare their systems with those of other students and acknowledge and accept different approaches that work for the user. Students are introduced to the simple security strategy of using passwords to protect access to their files when working on a network.

Students continue to develop their skills in using ICT to communicate knowledge by exchanging email messages with others. When seeking new information on topics of importance or interest in all areas of the curriculum, students apply a set of procedures (such as simple key words) for locating information on the intranet and the Internet, and they determine the value of these resources by developing and applying simple criteria (for example, considering the age of the intended audience). They transfer this knowledge when they evaluate their own products.

### National Statements of Learning

This learning focus statement, in conjunction with aspects of the Thinking Processes learning focus statement, incorporates aspects of the Year 3 National Statement of Learning for ICT.

Definitions of underlined terms are provided in the Glossary (page 95)

In addition students examine relevant values in particular ICT environments and identify issues and practices for using ICT in a safe and responsible manner. (National Statements of Learning for ICT).

## Standards

### ICT for visualising thinking

At Level 3, students use ICT tools to list ideas, order them into logical sequences, and identify relationships between them. Students retrieve their saved visualising thinking strategies and edit them for use in new, but similar situations. They explain how these strategies can be used for different problems or situations.

### ICT for creating

At Level 3, students organise their files into folders classified in a way that is meaningful to them. Students explain the purpose of passwords for accessing files stored on networks. They follow simple plans and use tools and a range of data types to create information products designed to inform, persuade, entertain or educate particular audiences. They create information products to assist in problem solving in all areas of the curriculum. With minimal assistance, students use ICT tools to capture and save images. They use simple editing functions to manipulate the images for use in their products.

They make ongoing modifications to their work to correct the spelling of frequently used words and to rectify simple formatting errors. They evaluate the final information product and describe how well it meets its purpose. Students make adjustments to their equipment and apply techniques that are ergonomically sound.

### ICT for communicating

At Level 3, students initiate and compose email messages to known and unknown audiences and, where appropriate, send replies. Students create folders in their mailbox to organise the storage of email messages they wish to keep. They locate information on an intranet, and use a recommended search engine and limited key words to locate information from websites. They develop and apply simple criteria to evaluate the value of the located information.

# Thinking Processes

## Introduction

Our world and the world of the future demand that all students are supported to become effective and skilful thinkers. Thinking validates existing knowledge and enables individuals to create new knowledge and to build ideas and make connections between them. It entails reasoning and inquiry together with processing and evaluating information. It enables the exploration of perceptions and possibilities. It also involves the capacity to plan, monitor and evaluate one's own thinking, and refine and transform ideas and beliefs.

The Thinking Processes domain encompasses a range of cognitive, affective and metacognitive knowledge, skills and behaviours which are essential for students to function effectively in society, both within and beyond school.

An explicit focus on thinking and the teaching of thinking skills aims to develop students' thinking to a qualitatively higher level. Students need to be supported to move beyond the lower-order cognitive skills of recall and comprehension to the development of higher-order processes required for creative problem solving, decision making and conceptualising. In addition, they need to develop the capacity for metacognition – the capacity to reflect on and manage their own thinking. This can only happen if the school and classroom culture values and promotes thinking and if students are provided with sufficient time to think, reflect, and engage in sustained discussion, deliberation and inquiry. Students need challenging tasks which stimulate, encourage and support skilful and effective thinking.

A focus on the development of thinking competencies within specific areas of the curriculum and across it not only serves as a core integrative function, it also has the potential to provide continuity in approaches to learning from Prep to Year 10 and to emphasise the view that such knowledge, skills and behaviours are important to lifelong learning. To emphasise this, teachers model skilful and effective thinking and make their own thinking explicit as part of their everyday practice.

Thinking skills can be defined in a variety of ways. Many different taxonomies and models for teaching thinking have been developed. Each classification scheme has its strengths and weaknesses. However, whatever the system or systems being used, all seek to improve the quality of student thinking.

## Structure of the domain

The Thinking Processes domain is organised into six sections, one for each level of achievement from Level 1 to Level 6. Each level includes a learning focus statement and, from Level 3, a set of standards organised by dimension.

### Learning focus

Learning focus statements are written for each level. These outline the learning that students need to focus on if they are to progress in the domain and achieve the standards at the levels where they apply. They suggest appropriate learning experiences from which teachers can draw to develop relevant teaching and learning activities.

### Standards

Standards define what students should know and be able to do at different levels and are written for each dimension. In Thinking Processes, standards for assessing and reporting on student achievement apply from Level 3.

### Dimensions

Standards in the Thinking Processes domain are organised in three dimensions:

- Reasoning, processing and inquiry
- Creativity
- Reflection, evaluation and metacognition.

#### Reasoning, processing and inquiry

The *Reasoning, processing and inquiry* dimension encompasses the knowledge, skills and behaviours required to enable students to inquire into the world around them, and to use critical thinking to analyse and evaluate information they encounter. Students learn to assemble and question information and develop opinions based on informed judgments. They also develop the capacity to transform information into coherent knowledge structures.

#### Creativity

The capacity to think creatively is a central component of being able to solve problems and be innovative. In the *Creativity* dimension, students learn to seek innovative alternatives and use their imagination to generate possibilities. They learn to take risks with their thinking and make new connections.

### Reflection, evaluation and metacognition

Learning is enhanced when individuals develop the capacity to reflect on, and refine their existing ideas and beliefs. In the *Reflection, evaluation and metacognition* dimension, students learn to reflect on what they know and develop awareness that there is more to know. They learn to question their perspectives and those of others. They evaluate the validity of their own and others' ideas. They also develop their metacognitive skills in planning, monitoring and evaluating their own thinking processes and strategies.

## National Statements of Learning

The Victorian Essential Learning Standards (VELS) incorporate the opportunities to learn covered in the national [Statements of Learning](http://www.curriculum.edu.au/mceetya/the_statements_of_learning,11893.html) (www.curriculum.edu.au/mceetya/the\_statements\_of\_learning,11893.html). The Statements of Learning describe essential skills, knowledge, understandings and capacities that all young Australians should have the opportunity to learn by the end of Years 3, 5, 7 and 9 in English, Mathematics, Science, Civics and Citizenship and Information and Communication Technologies (ICT).

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## Level 3

### Learning focus

As students work towards the achievement of Level 3 standards in Thinking Processes, they explore aspects of their natural, constructed and social world, wondering and developing questions about it. They use a range of sources of information including observations and findings from their own investigations to answer these questions. Students develop strategies for organising and summarising information and reflecting on their thinking. They begin to categorise knowledge and ideas, identify patterns, and form generalisations.

They learn to make connections between both new and established ideas and their own knowledge.

With thinking tools to assist them, students begin to ask more focused and clarifying questions. They develop skills in collecting and organising ideas from a range of sources to construct knowledge. They learn to question the validity of sources, communicate and record their questions, responses and thoughts, and give reasons for conclusions.

Students participate in a variety of investigations and activities involving problem solving that encourage them to experiment with a range of creative solutions. They begin to reflect on the approaches they use to assist them to form their solutions. They explore ideas creatively; for example, by engaging with new ideas and other perspectives.

Students give reasons for changes that may occur in their thinking. They begin to recognise that others may have different opinions and understand that reasoning can be influenced by strong feelings. They begin to question arguments presented to them; for example, those based on the assertion that 'everybody knows' or 'I just know'.

Students develop language to describe specific thinking processes and, with support, use thinking tools to assist them to complete a given task. They continue to reflect regularly on their thinking, learning to describe their thinking processes verbally.

## Standards

### Reasoning, processing and inquiry

At Level 3, students collect information from a range of sources to answer their own and others' questions. They question the validity of sources when appropriate. They apply thinking strategies to organise information and concepts in a variety of contexts, including problem solving activities. They provide reasons for their conclusions.

### Creativity

At Level 3, students apply creative ideas in practical ways and test the possibilities of ideas they generate. They use open-ended questioning and integrate available information to explore ideas.

### Reflection, evaluation and metacognition

At Level 3, students identify strategies they use to organise their ideas, and use appropriate language to explain their thinking. They identify and provide reasons for their point of view, and justify changes in their thinking.

# Glossary

## aesthetics

The appreciation of, and sensitivity towards, works of art, designs, products, objects or artefacts.

## algebra

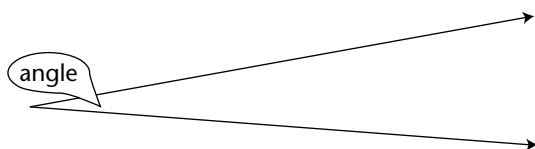
Refers to both the process of *manipulating* variables and constants in a mathematical expression according to fixed laws, properties or rules; for example, simplifying an expression or solving an equation; and alternatively to a *mathematical structure* whose elements and operations satisfy a given *collection of laws*. The word algebra comes from the work of the Arabic scholar *Abu Abd-Allah ibn Musa al-Khwarizmi*, who was born about 790 AD near Baghdad, and died about 850 AD. Khwarizmi wrote one of the first books *Hisab al-jabr w'al-muqabala* on what is now called algebra in 830 AD. *Al-jabr* refers to the process of moving a subtracted quantity to the other side of an equation while *al-muqabala* involves subtracting equal quantities from both sides of an equation. In 1140 AD this text was translated into Latin as *Liber algebrae et almucabala*, from which the word algebra has become part of mathematical language.

## algorithm

A process for computation that can be carried out mechanically; for example, the algorithm for subtraction of many-digit decimal numbers, or the algorithm for factorisation of a linear expression using the distributive rule. The word *algorithm* comes from the old English *algorisme*, from a Latin translation of the name of the ninth century AD Arabic scholar *al-Khwarizmi*, who investigated computation using the Hindu numeration system (leading to the Hindu-Arabic number system of today).

## angle

An angle is formed at the point of intersection of two rays:

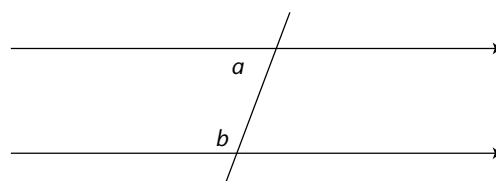


Angle *measure* is commonly based on the amount of turn between two rays with a common point. There are three common measures of angle: *fraction of a full turn*, *degree* and *radian*.

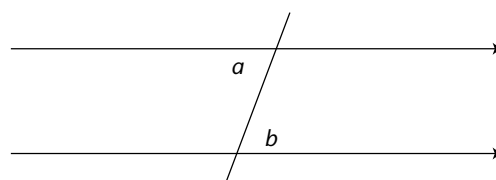
A full turn = 360 degrees =  $2\pi$  radian.

A half turn = 180 degrees =  $\pi$  radian.

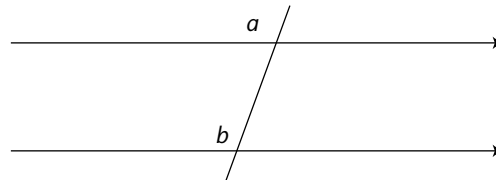
- **allied or co-interior (angles):** Angles which are between two parallel lines, adjacent to a transversal cutting that pair of parallel lines and sum to 180 degrees are said to be *allied* or *co-interior* angles, for example angles *a* and *b* in the following diagram:



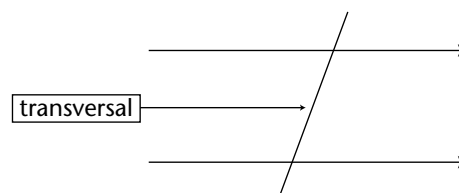
- **alternate (angles):** Angles which are symmetrically located under a half turn with respect to the midpoint of a transversal cutting a pair of parallel lines are said to be *alternate* angles, for example angles *a* and *b* in the following diagram:



- **corresponding (angles):** Angles which are in the same relative position with respect to a transversal cutting a pair of parallel lines are said to be corresponding angles, for example angles *a* and *b* in the following diagram:



- **supplementary (angles):** Angles at a point on a line that sum to 180 degrees are said to be supplementary angles.
- **transversal:** A line that cuts a pair of parallel line obliquely



## arts disciplines

Arts disciplines encompass distinct bodies of knowledge each with its own conventions, skills, expressive forms and language involving creation and performance, aesthetics, traditions, contexts and analysis. Schools use the six disciplines of Art,

Dance, Drama, Media, Music and from Level 5, Visual Communication as the starting points for delivery of student learning programs in the Arts.

### arts elements, principles and/or conventions

#### arts elements

The visual, tactile, sonic and spatial qualities and sensory components used to create and talk about two-dimensional, three-dimensional and time-based arts works. Arts elements traditionally associated with particular arts disciplines and forms include:

- *Art*: line, shape, space, texture, colour, form, tone, movement, surface, composition, sound
- *Dance*: space, time, energy, the body. Dance also uses production elements including music, sound, projected image, costume, make-up, properties, lighting and set-design
- *Drama*: voice, movement, gesture, focus, language, sound, silence, tension, conflict, climax, contrast, mood, symbol. Drama also uses stagecraft elements including acting, direction, dramaturgy, stage management, sound effects and/or accompaniment, properties, lighting, costume, make-up and set design
- *Media*: sound, colour, movement, light, images, pattern
- *Music*: pitch (melody and harmony), duration (rhythm, time and metre), dynamics and volume, tempo, tone colour, texture/timbre, instrumentation, tonality, articulation
- *Visual communication*: point, line, shape, tone, colour, texture, colour, letterform, sound.

Contemporary arts works often combine elements from a range of traditional arts disciplines and forms.

#### arts principles and/or conventions

Ways arts elements are used, arranged, manipulated and/or organised to create arts works. Arts principles are sometimes referred to as design principles and may also be referred to as compositional or structural devices or conventions; for example, theatrical conventions.

Arts principles and/or conventions include: unity, balance, harmony, distortion, abstraction, juxtaposition, contrast, space, hierarchy, level, scale, symmetry/asymmetry, proportion, cropping, repetition, relationships, pattern, sequence, emphasis, movement, rhythm, augmentation, diminution, variation, tension and release.

#### arts forms

Arts works can be categorised as forms representative of particular formal and informal fields, genres, products and/or structures.

This categorisation is generally determined by characteristics of the work such as the organisation of and relationships between arts elements in the work and/or specific technical, aesthetic and/or expressive qualities evident in the work. Some arts forms are traditionally associated with particular arts disciplines although these distinctions are less influential in the categorisation of contemporary arts works which are frequently described as being for example, 'multi-disciplinary' and/or in a 'hybrid form'.

Arts forms associated with specific disciplines include:

- *Art*: two-dimensional, three-dimensional, digital, collage, drawing, painting, photography, print-making, sculpture, textile/fibre (for example, tapestry, weaving, costume), installation, performance art, mask-making, mixed-media, ceramics, conceptual
- *Dance*: improvisation, learnt movement material, self- or group-devised, set movement material, solo, duet/partner dance, ensemble/group. Dance includes many genres which in turn each encompass a range of styles: for example, the genre of Classical Ballet includes styles such as Romanticism and Neo-Classicism; Contemporary Dance includes styles such as Graham, Cunningham, Limon and Horton; folk and ethnic genres include traditional dance forms of countries, cultures and indigenous societies, Musical Theatre and Commercial dance genres include jazz dance, funk, hip hop and tap
- *Drama*: story-telling, mime, puppetry, improvisation, spontaneous dramatic play, role-play, movement, process drama, enactment, devised drama, scripted drama, monologue, ensemble work, physical theatre, dance drama, theatrical forms such as poor theatre, or commedia dell'arte
- *Media*: television programs, film, video, photography, interactive CD-ROMs/DVDs, computer/electronic games, radio, print layout (for example, magazine, newspaper), sequence, collage, role-play, animation, claymation
- *Music*: instrumental, vocal, soundscape, composition, improvisation. Other music forms are based on compositional structures; for example, symphony, raga, blues, and song-form
- *Visual communication*: map, graph, symbol, diagram, chart, illustration, instrumental drawing, architectural drawing, three-dimensional model/form, poster, flyer/brochure, package, logo/corporate identity, two-dimensional layout, multimedia.



## arts language

Arts language is used throughout the Arts domain as an umbrella term for 'arts language, arts terminology and arts expressions'. Each of these facilitates the range of learning required in the Arts domain. Students can learn to speak/write about their works, about other people's works, they can learn to use symbol systems as appropriate and they can develop skills in speaking about arts in terms of content and use of technique, process, elements, principles and/or conventions, media, materials, equipment and technologies. Arts language includes:

- Arts language – aesthetic, oral, visual, symbolic including notation, gestural, physical, kinaesthetic and/or written language used in an agreed way to portray, communicate, describe, discuss, analyse, evaluate, and/or comment on arts works, events, ideas and/or concepts; for example, the symbol system that is Western music notation, or the symbols used by Cecchetti to document choreography and techniques.
- Arts terminology – formal learned terms used in particular ways to define, explain, and show recognition of and/or understandings specific to each arts discipline. Arts specific terms are associated with specific arts disciplines; for example, in Art, formal elements such as line, shape and/or texture. Many of these terms are used in more than one arts discipline and the meaning across disciplines can have strong connections (for example, sequence in Music and Media). More generally, however, the meaning is different between disciplines; for example, tone in Drama and Visual Arts.
- Arts expressions – words and phrases often associated with particular aesthetic perspectives and/or the vernacular of cultural artistic communications and aesthetic interpretations that are subject to change over time. For example, arts expressions such as 'primitive understanding' or 'soulless expression' can be used in arts works and commentaries/analyses etc. to communicate ideas, meanings, messages, observations, perceptions and/or concepts. Often these expressions combine formal terms and more colloquial language; for example, 'mise en scene' or 'structured improvisation'. Arts expressions are also used to communicate affective understandings; for example, a description of a movement phrase from a dance work such as 'crumpled up like a dried leaf'. Arts expressions vary according to the perceptions

and understandings of the user and the audience and are dependent on cultural and experiential contexts.

## associative

An operation is *associative* if the result of applying the operation to any three elements of an expression is the same regardless of which pair of elements (without changing their order) is combined first.

Addition and multiplication *are* associative on the set of natural numbers, for example:

$$4 + (7 + 5) = 4 + 12 = 16 \text{ and } (4 + 7) + 5 = 11 + 5 = 16$$

$$2 \times (3 \times 4) = 2 \times 12 = 24 \text{ and } (2 \times 3) \times 4 = 6 \times 4 = 24$$

Subtraction and division are *not* associative on the set of natural numbers, for example:

$$10 - (4 - 2) = 10 - 2 = 8 \text{ but}$$

$$(10 - 4) - 2 = 6 - 2 = 4$$

$$24 \div (12 \div 2) = 24 \div 6 = 4 \text{ but}$$

$$(24 \div 12) \div 2 = 2 \div 2 = 1$$

In general the *associative* laws (properties) for addition and multiplication of real numbers state respectively that *for all* real numbers  $a$ ,  $b$  and  $c$ :

$$a + (b + c) = (a + b) + c \text{ and } a \times (b \times c) = (a \times b) \times c$$

## chance and likelihood

The relative frequency of an event, this may be expressed qualitatively using terms such as: impossible, no chance, not likely, an even change, odds-on, likely, a certainty, or quantitatively using numbers on a scale from 0 (impossible) to 1 (certain). These numerical values are often expressed as fractions such as  $\frac{1}{2}$ , ratios such as 2:3, decimals such as 0.87 or percentages such as 40%.

## closure

The result of carrying out an operation on an element of a set, or elements of a set, is also an element of that set. For example, multiplication is closed on the set of natural numbers, because the result of multiplying any pair of natural numbers is also a natural number. Division is *not* closed on natural numbers, since 9 and 2 are both natural numbers, but the result of dividing 9 by 2 is not a natural number:  $9 \div 2 = \frac{9}{2} = 4.5$ , and 4.5 is a decimal fraction, not a natural number.

## commutative

An operation is *commutative* if the result of applying the operation to any two elements of a set is the same, regardless of the order of the elements.

Addition and multiplication *are* commutative on the set of natural numbers, for example:

$$6 + 12 = 18 = 12 + 6 \text{ and } 6 \times 12 = 72 = 12 \times 6$$

but subtraction and division are not commutative for example:

$$6 - 12 = -6 \text{ but } 12 - 6 = 6 \text{ and } 6 \div 12 = \frac{1}{2} \text{ but } 12 \div 6 = 2.$$

In general the *commutative* laws (properties) for addition and multiplication of real numbers state that for all real numbers  $a$  and  $b$ ,  $a + b = b + a$  and  $ab = ba$ , respectively.

### component

A part that makes up a whole, particularly in reference to a system. Examples of mechanical components include gears and pulleys and electrical/electronic components include batteries, switches and diodes.

### congruence

The property of being *identical* in shape and dimensions. Two shapes are congruent if one of them can be mapped onto the other by transformations that do not change the length of line segments or the angle between lines.

### conjecture

A statement whose truth or otherwise is not yet determined, but is open to further investigation, for example, *Golbach's Conjecture*: 'every even natural number greater than 2 can be expressed as a sum of two prime numbers'. First stated in 1742, the Golbach conjecture has not yet been either proven to be true or shown to be false, although many mathematicians intuitively believe that it is true.

### conventions

Commonly understood or accepted ways of doing something (for example, including a postcode in an address; displaying file size and download time required for video links in a webpage).

### counting

The process of listing a subset of the set of natural numbers  $N = \{0, 1, 2, 3 \dots\}$  in consecutive order; for example  $\{0, 1, 2, \dots\}$  or  $\{11, 12, 13, \dots\}$ .

### criteria

For information products include suitability for audience, accuracy, readability, effective use of colour, functional navigation links, and communication of intended meaning.

### decimal number

A number expressed using the base 10 place value system. For example 412.56 is a decimal number.

### design

A vital step in transforming ideas into creative, practical and commercial realities. Design optimises

the value of products and systems and is therefore an important key to economic, social and cultural development.<sup>1</sup> Other definitions of design include to plan or fashion artistically or skilfully, usually in working detail; to form or conceive in the mind; a scheme of attack; to intend for a definite purpose; an adaptation of means to ends; an outline, sketch or plan. Design may also involve production, and evaluating products in a real context.

### design brief

A statement that contains an outline of a situation, context, problem, need or opportunity, and specifications that apply to the problem. It is a means by which students can develop and apply knowledge and skills to solve problems. Design briefs can vary in the amount of information they provide and the way in which this information is presented. Both of these are usually determined by the level at which the students are working. Design briefs can be developed entirely by the teacher, or with varying degrees of student input.

### distributive

An operation is said to be distributive over another operation if it can take priority over the operation used for combination within brackets (that is, its application can be distributed over the brackets). Multiplication is distributive over addition for real numbers, for example:

$$6 \times 17 = 6 \times (10 + 7) = (6 \times 10) + (6 \times 7) = 60 + 42 = 102$$

The distributive property underpins algorithms for multiplication and division that involve natural numbers of several digits. In general the distributive law (property) for (multiplication over addition) for real numbers states that for all real numbers  $a$ ,  $b$  and  $c$ :

$$a(b + c) = ab + ac.$$

Addition is *not* distributive over multiplication, for example:

$$3 + (2 \times 4) = 3 + 8 = 11 \text{ but } (3 + 2) \times (3 + 4) = 5 \times 7 = 35$$

### division

For a finite set this is the process of partitioning the set into subsets of equal size. For natural numbers division re-expresses a given natural number in terms of a multiple of a smaller natural number and a remainder. For example  $68 = 7 \times 9 + 5$ , so 68 divided by 9 is equal to 7 with 5 remainder. Using rational numbers in fraction form this is expressed exactly as:

$$68 \div 9 = \frac{68}{9} = 7\frac{5}{9}$$

In general, for real numbers, if  $xy = z$  then

$$z \div y = \frac{z}{y} = x, \text{ unless } y = 0 \text{ in which case the process}$$

is not defined.

- **partition:** To divide into separate parts which together constitute the whole. For example, the letters of the alphabet can be partitioned into vowels and consonants, the set of natural numbers can be partitioned into those with remainder 0, 1 or 2 on division by 3.

### edge

A straight line or curve that forms the boundary of a region in the plane (such as the side of a triangle, or an edge in a network) or a boundary between two surfaces (such as the rim of a can or the edge of a box).

- **adjacency:** Two edges in a shape are said to be adjacent if they meet at a common vertex; similarly, two faces in a shape are said to be adjacent if they meet at a common edge.

### efficiency

Measured in terms of the effort, speed and cost of creating a solution or information product. For example, students explore techniques such as using short-cuts and macros to increase the speed of processing and reduce effort.

### emerging sciences

Traditional science discipline boundaries are being revised as new knowledge in science creates broader and novel applications of science. The emerging sciences include:

- **Nanotechnology**  
Further information can be found at <[www.nano.gov](http://www.nano.gov)>
- **Biotechnology**  
Further information can be found at <[www.gtac.edu.au](http://www.gtac.edu.au)> and <[www.biotechnology.vic.gov.au](http://www.biotechnology.vic.gov.au)>
- **Green chemistry**  
Further information can be found at <[www.chem.monash.edu.au/green-chem](http://www.chem.monash.edu.au/green-chem)>
- **Synchrotron science**  
Further information can be found at <[www.synchrotron.vic.gov.au](http://www.synchrotron.vic.gov.au)>

### empirical

Derived from observation, measurement or experiment.

### energy

Energy is defined as the amount of work required to change the state of a physical system. Energy may be classified as *potential* (stored) energy or

*kinetic* (moving) energy. Forms of energy include thermal, mechanical, electrical, gravitational, elastic, chemical, heat, light and sound. Energy may be transformed from one form into another. The presence of energy is revealed only when a change takes place. Animals obtain their energy from food. Toasters and washing machines use electricity as their energy supply.

### energy transformation

This refers to energy conversions from one form to another. Energy can be readily transformed from one form into another. Potential energy (stored energy, for example chemical, gravitational and elastic) may be converted to kinetic energy (moving energy, for example electrical, mechanical) and from kinetic energy to heat, light or sound energy. For example, using a battery to power an electrical heater converts chemical energy into electrical energy, which is then converted into thermal energy. Allowing elevated water to move down a hill transforms stored potential energy into the kinetic energy of moving water and turbines, which in turn may be transformed into electrical energy by a generator.

### equivalent fraction

Given any fraction, an equivalent fraction is one whose numerator and denominator is a common integer multiple of the numerator and denominator of the given fraction. For example, an equivalent fraction of  $\frac{1}{2}$  is  $\frac{2}{4}$ , with a common integer multiple of 2 such that  $\frac{(1 \times 2)}{(2 \times 2)} = \frac{2}{4}$ . For each fraction expressed in simplest form an equivalence class (or family of equivalent fractions) can be generated by successively multiplying its numerator and denominator by the natural numbers (excluding zero). For example, for the fraction  $\frac{2}{3}$ , the corresponding family is:

$$\left\{ \frac{2}{3}, \frac{4}{6}, \frac{6}{9}, \frac{8}{12}, \frac{10}{15}, \dots \right\}$$

### error

Is the difference between an actual value and its measured or estimated value and is defined as:  
error = measured or estimated value – actual value

### everyday texts

Everyday texts include spoken, print and non-print texts that are part of daily life. They include, for example, classified advertisements, personal letters, telephone conversations, messages, instructions, labels, electronic mail and web pages. Everyday texts also include newsletters, notices, signs and timetables associated with the specialised

demands of schooling. In general terms, the English curriculum gradually shifts in emphasis from simple everyday texts used in the home and school for personal, informal purposes towards more formal and complex everyday texts used in the home and the wider community.

### face/s

A bounded surface: a bounded region in a network, or on a three-dimensional shape or object.

- **adjacency:** Two edges in a shape are said to be adjacent if they meet at a common vertex; similarly, two faces in a shape are said to be adjacent if they meet at a common edge.

### finite

The set  $\{a, b, c, d, e\}$  is an example of a finite set. The set of all people alive on a given day is a very large, but finite set. The cardinal number of a finite set is a natural number, that is, the elements of any finite set can be put in a one-to-one correspondence with the elements of a set of the form  $\{0, 1, 2, 3, \dots, n\}$  where  $n$  is a natural number.

### formal unit

A unit whose value is fixed by agreement; for example, litre is a formal unit of capacity for fluids and hour is a formal unit of time.

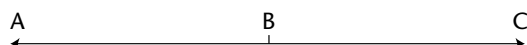
### function

A correspondence (map or relation) between the elements of two sets where each element in the first set is mapped to exactly one corresponding element in the second set. A function is either a one-to-one correspondence or a many-to-one correspondence.

- **dependent variable:** The variable associated with the *range* of a relation. For a function  $f$  with rule  $y = f(x)$ ,  $y$  is the dependent variable.
- **independent variable:** The variable associated with the *domain* of a relation. For a function  $f$  with rule  $y = f(x)$ ,  $x$  is the *independent* variable.

### golden ratio (phi $\phi$ )

Is the irrational number whose value is given by the proportion  $AC : AB = AB : BC$  where A and C are the endpoints of a line segment and B is the point on the line segment between A and C such that  $AC : AB = AB : BC$



It is called the golden ratio as it is believed to represent a proportion of lengths that is aesthetically attractive to the human eye in art and design contexts. The exact value of  $\phi$  is  $\frac{1+\sqrt{5}}{2}$  and its approximate value is 1.618 correct to 3 decimal places.

The decimal expansion for *phi* to 100 significant figures is:

1.618033988749894848204586834365638117720  
3091798057628621354486227052604628189024  
49707207204189391137.

The digits in this decimal expansion do not display any recurring pattern, a property which distinguishes irrational numbers from rational numbers.

### graph

A visual representation of data or functions. Cartesian graphs of functions and relations are plots of ordered pairs of values  $(x, y)$  that represent the function or relation relative to  $x$  and  $y$  coordinate axes and the fixed origin  $(0, 0)$ . Statistical graphs include dot plots, box and whisker plots, bar graphs and histograms.

### graphic/visual organisers

Frameworks that help students structure their thinking processes (including concept maps, time-sequence patterns, cause-and-effect patterns, flow charts). They are visual frameworks, which help students make connections between existing knowledge and new information, and make visible their thinking processes. Electronic templates can be created by teachers, or students can use available software for generating them.

### human and physical characteristics

- human characteristics refer to features of human activities such as farms, settlements, cities, ski resorts, shopping centres.
- physical characteristics refer to features of the natural environment such as rivers, mountains, forests, climate, coasts.

### ICT-controlled models

Tools used to control devices or actions in a pre-determined way; for example, controlling a robot.

### ICT tools

The range of hardware and software available to perform particular functions. For example, software such as spreadsheets can perform mathematical calculations; a digital camera can capture images.

### identity

An element of a set which when combined (using a given operation) with any other element of the set leaves that element unchanged. For example, 0 is the identity element for addition of natural numbers, since for any natural number  $n$  it is the case that  $0 + n = n$  and  $n + 0 = n$ . Similarly, 1 is the identity element for multiplication of natural numbers, since for any natural number  $n$  it is the case that  $1 \times n = n$  and  $n \times 1 = n$ .

**inequality**

A mathematical expression containing the terms 'less than', 'less than or equal to', 'greater than', or 'greater than or equal to' their respective symbolic representations '<', '≤', '>' and '≥'. For example 'the set of prime numbers less than or equal to 29', is an inequality as is the expression  $2y \geq x^2$  where  $x$  and  $y$  are real numbers.

**inference**

An assertion made on the basis of analysis from given data or propositions; for example, on the basis of the weather patterns observed over several years, a farmer might infer that it is likely to be a hot summer.

**infinite**

The set of natural numbers  $N = \{0, 1, 2, 3 \dots\}$  is an example of an infinite set. There are many examples of infinite sets, the set of all prime numbers is an infinite set (there is no largest prime number). The set of natural numbers,  $N$ , is an example of an infinite set which has a smallest element, 0, but no largest element. The set of integers  $Z = \{\dots -3, -2, -1, 0, 1, 2, 3 \dots\}$  is an example of an infinite set which has no smallest or largest element. The set  $\{0.9, 0.99, 0.999, 0.9999, \dots, 1\}$  is an example of an infinite set which has both a smallest element, 0.9, and a largest element, 1. It is *not* possible for the elements of any infinite set to be put in a one-to-one correspondence with the elements of a set of the form  $\{0, 1, 2, 3, \dots, n\}$  where  $n$  is a natural number.

**informal unit**

A unit whose value is decided on in a given context, for example, the use of a pace to measure distance or the use of a cupped hand to measure capacity of rice for a meal (irregular informal units). An informal unit may also be regular, such as the use of paperclips to measure length or a drinking glass to measure a small amount of a substance (capacity).

**information product**

Output created by students using ICT tools, functions and techniques to demonstrate their knowledge or understanding of ideas, concepts and processes from different areas of the curriculum. Typically printed or displayed on-screen; in some cases, output is an action as a result of students using an ICT-controlled model; examples include reports, slide shows, multimedia, cartoons, tables, websites and programs used to control robots.

**innovative/innovation**

To be innovative is to do something different, to explore new territory or to take a risk and is often

seen as an outcome of the broad exploration of ideas, materials, and technical processes that can occur during the design and technology process.<sup>2</sup> Technology has also been defined as 'human innovation in action'.<sup>3</sup> Creativity, defined as 'the application of knowledge and skills in new ways to achieve a valued goal',<sup>4</sup> is frequently linked with innovation.

**integer**

An element of the infinite set of numbers  $Z = \{\dots -3, -2, -1, 0, 1, 2, 3 \dots\}$ , sometimes also referred to as a positive or negative whole number.

**invariance**

The property of not changing under a process such as transformation; for example, the points on a mirror line are invariant under the transformation of reflection in that mirror line. If a person touches a mirror with their finger, then the point of contact will be invariant under reflection in the mirror, all other points their image will have left- and right-hand senses reversed.

**inverse**

For each element of a set its inverse with respect to a given operation defined on the set is the element in the set which, when they are combined using the operation result in the identity element. For example, the inverse of the integer +4 with respect to the operation of addition is the integer -4 since  $+4 + (-4) = 0$  and  $-4 + (+4) = 0$ . The inverse of the rational number  $\frac{2}{3}$  with respect to the operation of multiplication is the rational number  $\frac{3}{2}$  since  $\frac{2}{3} \times \frac{3}{2} = \frac{1}{1} = 1$ .

**investigation**

- In Mathematics, investigation is the exploration of a situation or context.
- In Science, investigations provide students with the opportunities to frame and pose questions which can be tested scientifically. Students work independently or in small groups or teams. They plan their work and select processes and equipment with attention to safety and draw conclusions from their data. They comment on the accuracy and reliability of the processes used and data collected, and complete a report of their investigation which can be presented in a range of formats.

**karnaugh map**

A diagram consisting of a small number of non-overlapping (mutually exclusive) rectangles used to indicate the relationship between elements of a set and given properties or attributes.



**literacies**

The term literacies encompasses the distinct language aspects of each subject such as the specialised language used to describe and analyse key concepts and the typical forms and conventions used to convey meaning. Through understanding of the literacies of the contexts in which they are working, students learn to make choices about the appropriate language to present ideas and information effectively for different purposes and audiences.

**literary texts**

Literature, which is fundamental to the English curriculum, uses language to represent, re-create, shape and explore human experience. Literary texts can be based on fiction or fact and includes written and spoken texts. Examples include picture storybooks, traditional stories, speeches, novels, short stories, plays, poetry, translated works, non-print texts and non-fiction works such as biographies. Through reading, writing, listening to and talking about literature, students extend their understanding of the world and of themselves, and they see how cultural beliefs and values are formed.

**location**

A description of position with respect to some fixed reference.

**logic**

Principles of reasoning where one proposition is deduced from other propositions.

**Material Safety Data Sheets (MSDS)**

MSDS provide the information needed to allow the safe handling of hazardous substances used at the workplace. Schools are required to comply with these procedures for the management of hazardous substances. An MSDS should provide sufficient information to enable users of the hazardous substances to handle them safely, to understand their potential dangers and to take appropriate action in case of an emergency.

**magnitude**

The size, or absolute value of a number; for example, both +5 and -5 have magnitude 5. The magnitude of certain numbers can only be approximated to a given accuracy, for example the magnitude of the number  $\pi$ , correct to two decimal places, is 3.14.

**material/s**

A material is a natural or synthetic resource that can be processed into a product by the use of tools and equipment. Examples of materials that students

learn about and manipulate are wood, fibres/fabrics/textiles, soils, metals, plastics, foods, plants and a variety of composites. The characteristics and properties of materials can influence the nature of products. In choosing materials, students need to think carefully about technical, social, cultural, economic, legal, environmental and ecological considerations. These considerations influence student decision making about the appropriateness of materials.

**measure**

A measure is a record of the magnitude of an attribute (such as weight, length, time, and likelihood) associated with an object or event.

**media, materials, equipment and technologies**

Two-dimensional, three-dimensional, time-based, sonic and physical objects and/or resources found in the natural and human environments and used to make and/or present arts works.

Media, materials, equipment and technologies often associated with traditional arts disciplines include:

- *Art and Visual communication*: two-dimensional and three-dimensional, hard, soft, wet, dry, papers, clays, videotape, pens, pencils, wire, crayons, washes, woods, metals, information and communications technology hardware and software, paints, dyes, cameras, natural (for example, shells, leaves, grasses, rice, sand, pasta), threads, plastics, film, canvas, fabric, moulds, glues, glass, light, cards, water, markers, chinks, plasticine, papier maché, straws, kiln, knives, sponge, ceramicists' tools (for example, clay-cutter, tools for creating decorative effects), silk-screen, balloons
- *Dance*: the body, whole or part body movements, locomotor and non-locomotor gestures and actions, dance studio/rehearsal room, music, technologies to support dance-making processes and presentation such as sound, lighting, make-up, properties, costume and information and communications technologies
- *Drama*: the body, voice, acting space, stimulus materials (for example, books, music, film/video, personal experience, pictures, myths, environments), technologies to support drama processes, production and presentation such as sound, lighting, properties, make-up, costume and information and communications technologies
- *Media*: images, sounds, objects, digital, recycled materials, technologies for making and recording and/or manipulating images and sounds (for

example, film, camera, editing software), technologies for presenting media products

- *Music*: voice, instruments (acoustic, electronic, digital), objects (for example, washboard, gourd), body percussion, recorded sounds, technologies for recording, sequencing and manipulating sounds, technologies for presenting performances; for example, microphones, speakers.

### media texts

Media texts include spoken, print, graphic and electronic communications with a public audience. They often involve numerous people in their construction and are usually shaped by the technology used in their production. The media texts studied in English are found in newspapers, magazines, and on television, video, film, radio, computer software and the Internet.

### metalinguage

A metalinguage is a language used to discuss language conventions and use, for example, the terms and definitions used in the various grammars to describe the functions of words in sentences and the terms used to describe and categorise structural features of different kinds of texts.

### model/modelling

- In Design Creativity and Technology, a standard or example for imitation or comparison; representation in miniature to show the construction of something; a typical or specific form or style; to form or plan according to a model.
- In Science, models are ways of representing complex structures and relationships. They are used to simplify a more complex arrangement; for example, the structure of matter represented through particle and atomic theory.
- Using mathematical concepts, structures and relationships to describe and characterise, or model, a situation in a way that captures its essential features.

### multimodal texts/formats

- In the Arts, multimodal forms combine; for example, visual images and sound in an installation work, or music, dramatic, kinaesthetic and visual elements in an opera, musical or shadow puppet play.
- In English, the modes of language are reading (including viewing), writing (including composing electronic texts), speaking and listening. Multimodal texts are those that

combine, for example, print text, visual images and spoken word as in film or computer presentation media.

### natural number

An element of the infinite set of numbers  $N = \{0, 1, 2, 3 \dots\}$ , sometimes also referred to as a counting number. In some references the number 0 is not included in the set of natural numbers; however, it is useful to include as it corresponds to the number of elements in an empty set.

- **even natural number**  
An element of the set  $\{0, 2, 4, 6, \dots\}$
- **odd natural number**  
An element of the set  $\{1, 3, 5, 7 \dots\}$

### net

A two-dimensional representation of a three-dimensional shape in such a way that it can be folded to construct the three dimensional shape.

### order

Is a relation that describes the location of elements in a set with respect to each other. These elements may be totally ordered or partially ordered. For example, the set of natural numbers is totally ordered by the relation less than or equal to since for any two natural numbers  $m$  and  $n$  exactly one of the following is true:  $m < n$  or  $m = n$  or  $m > n$ . Similarly, the set of students in a class can be totally ordered with respect to their height using the relation less than or equal to. However, the set of people at a school fair is only partially ordered by the relation 'is a parent of' since there will likely be many pairs of people who are not each others parent, such as siblings.

### periodic

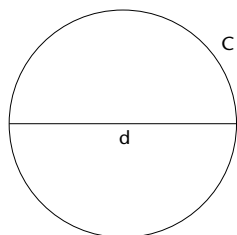
Repeats at regular intervals; for example, if the elements of the set of natural numbers are divided by 3, in order, and the remainder on division recorded, the following periodic pattern of remainders occurs:

0, 1, 2, 0, 1, 2, 0, 1, 2, 0, 1, 2 ...

The graph of a function that describes the rise and fall of tides in a given location from high tide to low tide over several days will also be periodic.

### pi

Represented by the symbol  $\pi$ , is the irrational number defined by the ratio of the circumference  $C$  of a circle to its diameter,  $d$ :



Its approximate value, correct to 2 decimal places is 3.14, and  $\frac{22}{7}$  is a reasonably accurate fraction approximation to  $\pi$ . The decimal expansion for pi to 100 significant figures is:

3.141592653589793238462643383279502884197  
1693993751058209749445923078164062862089  
98628034825342117068.

The digits in the continued decimal expansion of  $\pi$  do not have any recurring pattern, a property which distinguishes irrational numbers from rational numbers.

### planned information products

Products for which the form and layout is designed by students before any data is processed. Typically students would decide how their product would be viewed – printed, on-screen, or as an action – and how the major elements of the product will be displayed. Students then process the data in accordance with their design.

### problem posing

Formulating a problem in such a way that it is amenable to mathematical analysis.

### problem solving

The application of mathematical reasoning to the development of a solution or solutions to a given problem.

### product/s

The output of human activity in the form of an artefact. A technological product is an artefact created to meet an identified need or want.

### purposes of information

To entertain, to persuade, to educate, to inform.

### rational number

An element of the infinite set of numbers:

$Q = \{\frac{m}{n}, \text{ where } m \text{ and } n \text{ are integers and } n \text{ is not equal to zero}\}$ , sometimes also referred to as a fraction. Rational numbers can be expressed in fraction form, with corresponding terminating decimal expansion, for example,  $\frac{1}{8} = 0.125$ , or with infinite recurring decimal expansion, for example,  $\frac{4}{9} = 0.444...$

Rational numbers may be positive or negative; for

example,  $-\frac{17}{5}$  is also a rational number.

### recursion

The process of carrying out the current step of a process using the results of the previous step (or steps) of the same process. For example, the sequence of numbers:

$\{3, 6, 12, 24 \dots\}$  can be described using recursion as 'start at 3 and make the next term in the sequence twice the previous term in the sequence'. Students often intuitively define sequences using recursion. Skip-counting; for example, 'counting by fives starting from 12' is another example of a recursive process.

### reflection

A transformation where each point in the plane is reflected in a given mirror line.

### remainder

If  $m$  and  $n$  are two natural numbers with  $m$  greater than  $n$ , such that  $m = p \times n + r$  where  $p$  and  $r$  are also natural numbers, then  $r$  is said to be the remainder of  $m$  on division by  $n$ . For example, if  $m = 29$  and  $n = 6$ , then  $m = 4 \times n + 5$ , so the remainder of 29 on division by 6 is 5.

### sample

A subset of a population; for example, a set of people used for a newspaper survey is a sample of the population. A *random* sample is one which is obtained by using a random process for selecting a sample.

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### scientific vocabulary

This refers to the words used by scientists to accurately describe matter, organisms, processes and systems. These words have an exact meaning or definition, and application. Sometimes these words are used incorrectly or imprecisely when applied in everyday use.



## set

'set' is an undefined term that informally corresponds to the notion of a collection of objects or elements. Sets are usually specified by listing their elements, for example: { a, e, i, o, u }, describing them in words; for example, 'the set of Australian citizens', by or using a mathematical rule:

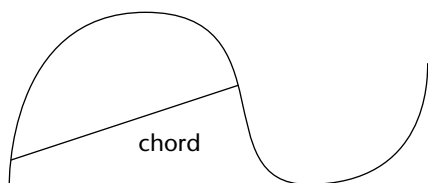
$$\{(x, y) : y = 2x + 1, x \in N\} = \{(0, 1), (1, 3), (2, 5), (3, 7) \dots\}.$$

- **element:** is an undefined term that informally corresponds to the notion of *belonging* or *membership* of a set. For example, 3 is a member of the set of natural numbers  $N = \{0, 1, 2, 3, \dots\}$ . This relation can be written more concisely as  $3 \in N$ . The symbol ' $\in$ ' is a short-hand for 'is an element of'. The number  $\frac{1}{2}$  is not a natural number, and this can be written as  $\frac{1}{2} \notin N$ , where  $\notin$  is a shorthand for 'is **not** an element of'.
- **power set:** of a given set is the set of all possible subsets of the given set, including the empty set and the given set itself. For example, if  $A = \{a, b, c\}$  then the power set of  $A$ , written  $P(A)$  is the set  $\{\{\}, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}\}$ . If there are  $n$  elements in the set  $A$  then there are  $2^n$  elements in its power set, in this example  $A$  has 3 element and its power set has  $2^3 = 8$  elements.
- **universal set:** In a given context, the *universal set* is the set of all objects under consideration. For example, the set of natural numbers is often the universal set for basic arithmetic computation in the early years of schooling. When students conduct a survey about students in their school, the set of all students in the school is the universal set (often called the population in this situation) for the survey.

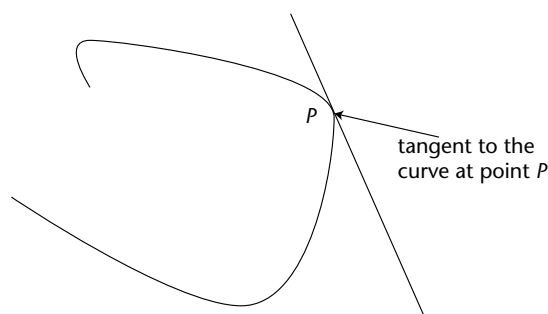
## shape

A geometric object or representation of a common real-life object, in two-dimensional space, such as a free-hand closed curve, a triangle, circle, square; or in three-dimensional space (also called solids) such as a blob of play-dough, a cube, sphere or pyramid.

- **chord:** A line segment joining two points on a curve:



- **cross-section:** The shape produced by cutting a three-dimensional shape completely through by a plane.
- **shadow projection:** The two-dimensional image formed on a plane surface by the shadow of a three-dimensional object illuminated by a light source; for example, a person's shadow on the ground on a sunny day. In geometry this usually corresponds to the projections of a shape onto three plane surface at right angles to each other, such as front view, side view, top view.
- **tangent (local tangent):** A line that touches but does not cut a curve at a point:



In the case of a circle, a tangent is always at right angles to the radius which meets the circumference of the circle at the point of contact.

## similarity

The property of one shape being an exact enlargement or reduction of another shape.

## skills, techniques and processes

Ways and methods of using and manipulating elements, principles, media, materials, equipment and technologies. Skills, techniques and processes can be used to realise ideas, achieve specific effects, investigate creative outcomes for expressive, aesthetic and/or technical tasks and/or to explore (practically, by observation and/or through discussion) aesthetic and communicative potential of media and materials. Skills and techniques can be practised in isolation but are generally used as part of an arts-making process.

Artists also use a range of processes to document (in verbal, written, physical and/or visual forms) working and/or thinking practices, and/or comment on/critique arts works.

## skip counting

Counting from a given starting value using multiples of a fixed natural number; for example, {2, 4, 6, ...} or {7, 12, 17...}.

### spatial concepts

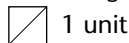
Spatial concepts are the organising concepts common to all branches of geography. From Level 1 through to Level 6, and beyond, spatial concepts can be used and applied according to the stages of learning – laying the foundations, building breadth and depth, and developing pathways. Although there are many organising concepts, there are nine commonly recognised concepts:

- **location:** Where natural and built phenomena are found on the surface of the Earth. A place has an absolute location measured accurately by co-ordinates, and a relative location measured by distance and direction from one place to another.
- **scale:** The term 'scale' includes two uses.
  - The map scale shows the relationship between measurements on a map and the actual measurements on the ground. Map scales are expressed in words, by a line scale, or as a representative fraction. A large scale map covers a small area with detail; a small scale map will cover a larger area with less detail.
  - The observational scale refers to the size of an area being studied. A range of scales includes the following:
    - **local scale:** Involves the smallest area and is immediate to wherever the study is taking place. Fieldwork is conducted at the local scale.
    - **regional scale:** Covers a larger area than the local scale. The study of the Murray–Darling Basin is at a regional scale.
    - **national scale:** Focuses study on a nation, for example, the Australian government's response to a global phenomenon.
    - **international scale:** Considers two or more nations. The combined efforts of several Asian nations would be an example.
    - **global scale:** Considers a significant proportion of the Earth, for example, the distribution of rainforests across the Earth.
- **distance:** The space between different locations on Earth. The absolute or linear distance is measured in units such as metres and kilometres. The relative distance is the length of time it takes to travel from one location to another, cost involved and the convenience of the journey.
- **distribution:** The arrangement of things at or near the Earth's surface viewed at a variety of scales.

- **region:** A definable area of the Earth's surface which contains one or more common characteristics that distinguish it from other areas. Regions are different for different groups of people. For example, Oakleigh South (local), Gippsland (regional), Australia (national), Sub Saharan Africa (international).
- **spatial change over time:** The degree to which an area has changed its geographic characteristics, features or patterns of use over a period of time. Change occurs at varying rates at different times and may be considered at different scales. For example, the redevelopment of the Melbourne Docklands since the 1990s would look at distribution, spatial association between things, movement and spatial interaction.
- **movement:** The change in location of one or more things across the Earth's surface. Movement includes direction, method, rate, nature and volume.
- **spatial association:** The degree to which things are similarly arranged over space. Spatial association compares distribution patterns. A strong spatial association occurs where two distributions are similar. Weak association describes little similarity. No association occurs when two distributions are dissimilar.
- **spatial interaction:** The strengths of the relationships between phenomena and places in the environment, and the degree to which they influence or interact with each other. Over time, the impact of people on the environment changes and the environment in turn changes people.

### square root of 2

Is the irrational number,  $\sqrt{2}$ , whose value corresponds to the length of the diagonal of a unit square.



Its approximate value is 1.414 correct to 3 decimal places. The decimal expansion for the square root of two correct to 100 significant figures is:

1.414213562373095048801688724209698078569  
6718753769480731766797379907324784621070  
38850387534327641573.

The digits in this decimal expansion do not display any recurring pattern, a property which distinguishes irrational numbers from rational numbers.

### standard unit

A formal unit from a system of units which is comprehensive and is used to define other units or combinations of units. For example, in the metric system, the standard units for *length*, *mass* and *time*

are respectively, *metre*, *kilogram* and *second*. The standard units are described in the International System of Units (SI). Related *formal*, units are:

$$\text{centimetre} = \text{metre} \times \frac{1}{100}$$

$$\text{tonne} = \text{kilogram} \times 1\,000$$

$$\text{minute} = \text{second} \times 60.$$

Other non-standard formal units are, for example, carat, gallon, hour and knot.

### strategies for reading

Strategies for reading include:

- techniques such as reading the cover and contents page when selecting texts
- predicting, checking, confirming and self-correcting using knowledge of a topic
- browsing, skimming and scanning for key words and content
- using computer technology to locate and explore information.

### strategies for writing

Strategies for writing include:

- planning, composing, recording, editing and publishing
- using word-processing and graphics programs to create, edit and publish texts
- phonic, visual and morphemic strategies for attempting to spell unfamiliar words
- consulting resources such as a dictionary and thesaurus.

### structures and features of language

Structures of language refer to characteristics of the overall ordering and organisation of texts. Features of language refer to the grammar of speech and of writing. Throughout the years of schooling, students need to develop abilities to use the following structures and features of written and spoken language:

- print elements, such as letters, words, spelling, paragraphs, punctuation, layout and presentation
- textual and grammatical aspects of language, such as sentence structure and vocabulary
- patterns of text structure and organisation of various kinds of texts, including narrative, exposition, verse, narrative voice and point of view
- intonation, rhythm, pace, pitch, volume and pauses in spoken language
- non-verbal elements of communication, such as facial expression, body movement, proximity and gestures, and the graphic elements of

texts, such as the impact of illustrations on the meaning of a text.

### structures of information

How parts of information are arranged (for example, detailed or summarised, or presented in blocks of text with hyperlinks to external files).

### sustainability

Sustainability is an ecological, economic, social and political concept. A sustainable society is one that meets the needs of the present without compromising the ability of future generations to meet their own needs. In the Science domain, issues which need to be considered for sustainability include: the conservation of biodiversity and ecological integrity; dealing judiciously with risk, uncertainty and irreversibility; ensuring appropriate valuation of environmental assets; integration of environmental and economic goals in government and institutional policies and activities; social equity (both intragenerational and intergenerational); and community participation.

Resources:

- <[www.earthcharter.org](http://www.earthcharter.org)> for information about The Earth Charter (a United Nations initiative) and listing a number of teaching and learning resources
- <[www.unesco.org/education/tlsf](http://www.unesco.org/education/tlsf)> provides access to 'Teaching and Learning for a Sustainable Future', a multimedia teacher education programme published by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). It contains 25 professional development modules for teachers, teacher educators and student teachers, as well as curriculum developers, education policy makers and authors of educational materials. The program may be used in both pre- and in-service teacher education, by individuals or by groups.
- Australian Government Department of the Environment and Heritage, 'Educating for a Sustainable Future', A National Environmental Education Statement for Australian Schools, Curriculum Corporation, Carlton South, Victoria, 2005.

### symbolic

Using marks or symbols that have a meaning particular to mathematical language, for example, the written statement 'two is less than 3' can be written symbolically as ' $2 < 3$ '.

**symmetry**

Property of regularity in shape by, for example, reflection or rotation. Thus the letter **T** is symmetrical by reflection, the letter **Z** is symmetrical by rotation, the letter **H** is symmetrical by both reflection and rotation, the letter **R** is *not* symmetrical.

- **asymmetry:** Irregular, does not display symmetry. The human body is asymmetrical with respect to an imaginary line down the middle.

**system**

In Design, Creativity and Technology, a combination of elements that work together so that a specific outcome is achieved. Systems are used, applied and developed in all areas of human activity. Especially important are environmental, engineering, energy, manufacturing and information systems. Examples of technological systems are a television, a sewing machine, a bicycle, a conveyor belt, and an electronic alarm. All technological systems have specific inputs, processes and outputs that are controlled manually or automatically. Management and programming of systems are important in technology.

Each system contains separate elements that are connected in a specific way so the system will work. In some systems; for example a door lock, the elements or components are within the one system. In others; for example a car, the elements are a series of subsystems and might, as in the thermostat control of a heating system, contain feedback components.

Whether a system is appropriate depends on the technical, economic, environmental and social and cultural consequences of its application/s as well as on how well it meets human needs. Students have to consider these factors on both a local and global level and estimate their future impact on societies and environments.

In Science, Systems consist of inputs, processing and outputs for a group of organs (or cells) that work together to provide living things with advantages for survival. Systems can be found in plants and animals (including humans). Systems work alone and with other systems. The human body is an example of a complex system and illustrates the progression from *cells* to *tissues* to *organs* and then *systems*. Maintaining *homeostasis*, or a stable internal environment, enables humans to survive.

**(technological) technique/process**

Human activity (for example, cutting, shaping, soldering, blending, and digging) that brings about a change in a material or to a system; usually carried out using tools, equipment and machines when working with materials and components.

**tessellation**

A repeated pattern in the plane or on a surface where shapes completely fill all of the space around a given point where their boundaries meet. For example, a honeycomb is a tessellation using hexagons. Tiling patterns are tessellations using rectangular tiles or brick pavers in paths, mosaics in buildings, quilts and art.

**texts**

Texts studied in English include a range of written and spoken texts, from informal to formal, in print, electronic and multimodal formats. They may include speeches or conversations, novels, storybooks, newspaper articles, transactional texts such as letters, invitations or interviews, as well as reports, posters, performances of plays or films, and advertisements. Texts also include the communications composed on, or transmitted by, computers or other technological tools. Teachers draw material from:

- literary texts
- everyday texts
- media texts
- workplace texts.

As these categories are interrelated, some texts may belong to more than one category.

**transformation**

A one-to-one correspondence of points in the plane. *Reflections*, *rotations* and *dilations* are examples of transformations.

- **isometric:** Literally 'the same measure', an isometry is a transformation that leaves lengths, area and angles unchanged.

**undefined term**

A term or expression taken as accepted without definition. These are the basic building blocks of mathematics; for example, element and set are undefined terms in the *Structure* dimension, while point and line are undefined terms in the *Space* dimension. Undefined terms may be characterised by informal description, or illustrated by examples. Other mathematical terms and expressions are defined using undefined terms and relations on them.

**unit**

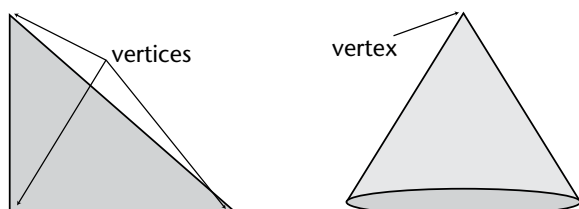
A basic or fundamental construct for counting and/or measurement. For example, the number 1 is the unit for counting (from the Latin *unus* for one). The metre is the standard unit for measurement of length in the metric system.

### variables

Variables are factors that can and do affect the outcome of experiments. Some variables can be controlled during experiments. These are known as *control variables*. The impact of some variables can be reduced by refining procedures and/or repeating the experiment many times. Only one variable should be included in the design of an experiment.

### vertex (also node or corner)

A vertex is a point in the plane or in space where several edges meet, but do not extend beyond, for example the corners of a triangle or the point of a cone:



### visualising thinking

The process of using ICT tools and editing techniques to visually code and represent thinking (for example, classifying data by colour coding; using a graphic organiser such as a concept map to discover links between data; using simulation software to model a process). It is a process that allows students to clarify thought, and to identify patterns and form relationships between new and existing knowledge.

### workplace texts

Workplace texts include spoken, print and electronic forms of communication commonly encountered in enterprises across a wide range of industries, including business letters, resumes, memoranda, short reports, formal and informal minutes. Practice in interpreting and producing such texts is a valuable part of students' preparation for the world of work and further training.

### Web references for Mathematics

#### School of Mathematics and Statistics at the University of St Andrew's, Scotland

<[www-history.mcs.st-and.ac.uk/history/](http://www-history.mcs.st-and.ac.uk/history/)>

This website provides topic, context, chronology and biographical historical references, and links to other history of mathematics sites.

#### Cut The Knot, Alex Bogomolny

<[www.cut-the-knot.org/glossary/atop.shtml](http://www.cut-the-knot.org/glossary/atop.shtml)>

This website contains an extensive mathematical glossary, items of interest, mathematical games and puzzles and is a mathematics forum.

#### A Dictionary of Units, Frank Tapson

<[www.ex.ac.uk/cimt/dictunit/dictunit.htm](http://www.ex.ac.uk/cimt/dictunit/dictunit.htm)>

This website provides a comprehensive summary of many of the units of measurement in use around the world today, some units of historical interest and conversions into standard SI units. It also contains links to other sites related to units and measurement.

- <sup>1</sup>. Fleming, D (2004), *Lab.3000 – innovation in digital design Business Plan*, RMIT University.
- <sup>2</sup>. Lynch, G (2001), 'Towards Innovation', *Executive Excellence*, 18(8), August, Australia.
- <sup>3</sup>. Raisen, A (2003), 'An Analysis of the Technology Education Curriculum of Six Countries', *Journal of Technology Education*, 15(1), p. 39, Fall.
- <sup>4</sup>. Commonwealth of Australia (2003), *Australia's Teachers: Australia's Future, Advancing Innovation, Science Technology and Mathematics*, Main Report, p. 22, Department of Education, Science and Training.

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